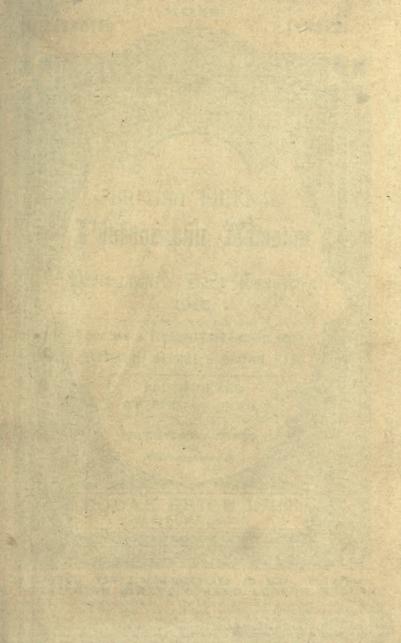
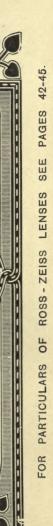
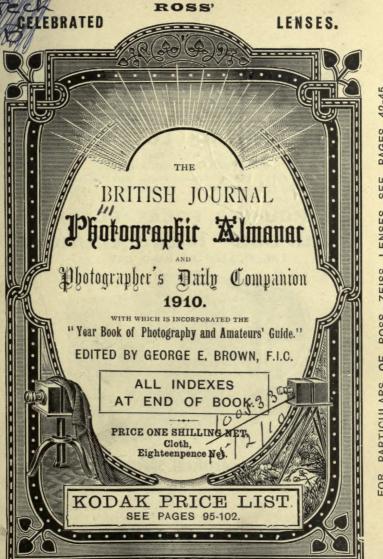


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(Established 1854),

Manufact:rers of PHOTOSRAPHIC CHEMICALS and APPARATUS, Contractors to His Majesty's Government,

161, STRAND, LONDON, W.C.

PRIZE MEDALS AND AWARDS:-

London, 1862; Dublin, 1865; Paris, 1867; Bristol, 1881; London, 1885; Dundee, 1886; Crystal Palace, 1888 and 1904.

"Eureka" Hand Camera

THE PICNEER OF HAND CAMERAS.



W. A. Rouch's Magnificent Sporting Photographs

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Prices of the "Eureka" Camera, with Rouch's New Planastigmat Lens, focal plane shutter, brilliant finders, detachable changing back, and all modern improvements, complete:—

 $4\frac{1}{4} \times 3\frac{1}{4}$.. £10 10 0 5 × 4 .. £13 13 0 6\frac{1}{2} \times 4\frac{3}{4} .. £16 16 0

Solid Leather Sling Cases, with spring locks, $\frac{1}{4}$ -plate, 21/-; $\frac{1}{5}$ - plate, 30/-

The "Eureka" is the Camera par excellence for PICTORIAL ILLUSTRATION.

[See following page.]

ROUGH'S SPECIAL "MODEL" TENT.

FOR DRY PLATE WORK.



A special modification of the original "Model" tent, introduced by ROUCH & Co. in 1859.

PRICES COMPLETE.

Including improved stand, portable sink, cistern, clip and tube, etc., fitted with lock and key.

THE STATE OF THE STATE OF	£	8.	d.
For Plates up to			
8½ × 6½ · · · · · ·	6	10	0
Ditto up to 10 × 8	7	0	0
,, ,, 12 × 10	7	10	0
Model Tent, large			
size, for plates up		153	
to 15 × 12 ins. with	100	· Can	100
extra strong stand	8	10	0

Rouch's Dry Plate Washing Trough.

PORTABLE CHEMICAL LABORATORIES FOR DRY PLATE WORK.

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Complete Sets of Apparatus.

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- "EURYPLAN" Anastigmat Lenses.
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- STALEY WHEELER Patent High Power Convertible Telephoto Lens.
- STALEY WHEELER Patent Concentric Collapsible Lens Hoods.
- "ROYAL" Reflex Cameras.
- SCHOTT Glass Optical Isochromatic Screens.

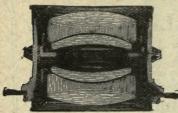
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Sole representatives for England and Colonies for the following firms:

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- G. GEIGER, Munich. Ewon Automatic Are Lamp.
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ANASTIGMATS. "EURYPLAN"



Series II. f/5.6. Series I. f/4.5.

The remarkable success which attended the introduction of the series of Anastigmat lenses known the world over as the Euryplan continues, and is due to the fact that the lenses are optically perfect, and we do not claim for them any inflated properties which we are not capable of proving by actual test.

We hold the Class" A" Certificate at the National Physical Laboratory for each series, which is the highest form of guarantee we can submit to intending purchasers. Moreover, to still further prove our absolute con-

Series III. 1/6.8. Series IV. 1/6.5. fidence in the Euryplan, we offer to send any lens on free trial, for a period of seven days, before purchase if desired. Euryplan Anastigmats possess the advantage of being symmetrical, and the single combinations giving double the focus of the complete objective cover the plate, for which the complete lens is made perfectly at full aperture with critical definition. Only in the single combinations of the Series I. is it necessary to slightly stop down. As complete lenses no finer or better instruments exist, while the prices quoted are exceedingly favourable to the purchaser.

EURYPLAN.

			Seri	les 1. r/4	o.	Ang	316 gn.		the state of	
	Plate covered.		Plate covered.		0.	us.	Plate	covered.	ice Iris umt.	
No.	Plate f/4.5	f/4·5	f/16	P. iii J	ž	Z	Focus	f/4·5	f/16	Pr mo mo
00 0 1 _A 1 2	310 434 51 6	31× 25 43× 31 5 × 4 6 × 4 7 × 5	4 × 3 6 × 4 6½ × 4¾ 7 × 5 8 × 6	5 0 0 5 10 0 6 0 0 7 5 0 8 10 0	3 4 5 6	8 ¹ / ₄ 9 ¹ / ₂ 10 ³ / ₄ 12	8 × 6 9½ × 7 10 × 8 12 ×10	9½×7 10½×8 12×10 14½×12	10 0 0 13 15 0 16 10 0 19 5 0	

Single combination works at f/8 5.

Series II. F/5'6. Angle 90°. Series III. F/6'8 to F/7'7. Angle 82°. FURVELAN. EURYPLAN.

					400				Maria Contract of the Contract
No.	Focus.	Plate c	overed.	Price in Iris mount.	No.	Focus.	Plate c	overed.	Price in Iris mount.
	1					H		-	· H
00 0 1A 1 2 3 4 5 6 7 8 9	6 7 84 953 104 12 165 195 24	3½ × 2½ 4½ × 3½ 5 × 4 7 × 5 8 × 6 9½ × 7 10 × 8 12 × 10 14 × 12 15 × 12 20 × 16 24 × 20	$\begin{array}{c} 4\frac{1}{4} \times 3\frac{1}{2} \\ 6 \times 4 \\ 7 \times 5 \\ 8 \times 6 \\ 9\frac{1}{2} \times 7 \\ 10\frac{1}{2} \times 8 \\ 12 \times 10 \\ 16 \times 12 \\ 20 \times 16 \\ 24 \times 20 \\ 26 \times 22 \\ 24 \times 28 \\ 36 \times 32 \\ \end{array}$	3 5 0 4 5 0 4 10 0 4 15 0 5 10 0 9 0 0 11 0 0 13 15 0 18 0 0 23 10 0 44 0 0	00 0 1 1 2 3 4 5 6 7 8 9 10	3½ 4¼ 5¼ 6 7 8¼ 10¾ 12 14½ 16½ 19 24	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	4 ³ / ₄ × 3 ³ / ₂ 6 × 4 7 × 5 8 × 5 9 × 7 10 × 8 12 × 10 14 × 12 16 × 12 20 × 16 20 × 16 24 × 20 30 × 24	2 15 0 3 5 0 4 0 0 4 10 0 6 0 0 7 5 0 8 15 0 14 5 0 14 5 0 24 15 0 33 0 0
Si	ngle	combinati	on works a	bout f/11.	Sin	ngle	combinatio	on works a	bout f/13.5.

Focussing Mount, 10/- extra. Sunk Mounts, 5/- extra. Pairing lenses for stereoscopic work 10/- extra.

"NULLI SECUNDUS."

EURYPLAN. Series IV.

F/6.5. ANASTIGMATS.



The success which followed the introduction of this lens in November, 1907, has been well maintained, and we are constantly receiving unsolicited testimonials from all parts. speaking most highly of its optical qualities. We supply this lens, which is composed of two sets of three lenses, cemented, and having no air-space in the combination, at the following prices. Mounts are of Magnalium with iris diaphragm, Special attention is given to the selection of these lenses, and no lens bearing our name can possibly be optically bad owing to this rigid supervision. This fact cannot fail to impart confidence to the intending purchaser.

7 in. 43in. 54 in. 6 in. 81in. £5 0 0 .. £6 10 0 .. £8 5 0

Anastigmat Lens.



Although the prices quoted for the new '' Phaos'' f/6.8 Anastigmat lenses are, in comparison with other high-class lenses, very low, this must not be taken as a sign of inferior quality. This we most emphatically state. The quality is of the highest and the workmanship of the very best. Our aim has been to produce a lens at a low figure which will obtain the "A" certificate at the National Physical Labora-

tory, as is the case with our Euryp'an series of lenses. We are willing to forward the "Phaos" on trial to any part of the world to be compared with any other make of Anastigmat. The "Phaos" is composed on the well-known form of three cemented lenses to each combination, and is a symmetrical double anastigmat. It is mounted in brass with iris diaphragm. Sunk mounts for Reflex cameras are supplied at 5/- extra and Focussing mounts at 10/- extra on the price Apertures f 6.8 to f7.5. of the lens :-

Planastigmat. A Double Anastigmat of the Latest Construction.

F/6.8. Angle 82°.



8 Lens System.

These new Lenses are of the highest quality, and are well and carefully constructed, special features being: Great rapidity, owing to the specially selected materials used in their construction; flat field; sharp and critical definition to the extreme margin of plate, and great depth of focus. These qualities have brought these Lenses to be recognised as one of the best Anastigmats in the market. They may be used with full aperture 1/6-8 for any subject, architecture, portrait, copying or landscape work, and with a small stop make a splendid wide-angle lens. The single com-

with a small stop make a splendid wide-angle lens. The single combinations are perfectly corrected for Astigmatism, spherical aberration and achromatism, and may be used separately, giving a single Lens of double the focus of complete Lens. For Stereescopic work Lenses of 43", 53", and 6" focus may be had paired at an extra charge of 6/0 per pair; they may also be supplied in Unicum, Automat Compound or Volute Shutters.

Plates Covered.

No.					Price.
0	43	4½× 3½	4 × 5	6 × 4½	 £3 0 0
1A	5½	5 × 4	6 × 41	7 × 5	 3 8 0
1	6	6 × 4½	7 × 5	8 × 6	 3 15 0
2	7	7 × 5	8 × 6	9 × 7	 4 10 0
3	81	8 × 6	9½× 7	10 × 8	 6 5 0
4	91	9½× 7	10 × 8	12 ×10	 7 10 0
5	104	10 × 8	12 ×10	14 ×12	 9 5 0
6	12	12 ×10	14 ×12	15 ×12	 11 0 0
7	14½	14 × 12	15 ×12	18 ×16	 13 15 0
8	163	15 × 13	16 ×14	20 ×15	 17 10 0
9	19"	20 × 15	213×173	24 × 20	 22 10 0
-				1111 01 1100	 TT 10 0

The Pancratic. A Complete Positive & Telephoto Lens Combined.

The introduction of the Pancratic Telephoto Lens opens up quite a new field in this most interesting branch of photography, and for a quick, medium power lens, reasonable in price, it is unequalled.

The Pancratic Lens is in itself a complete Telephoto System with positive lens combined, used in an ordinary between-lens shutter, and is primarily intended for use as such, although the positive portion can be used alone if desirable, but no advantage would be gained over an ordinary lens of 6-in. focus.

Full and interesting leaflet will be forwarded free.



Price, complete in leather map case, £3 3 0.

IMPROVED TELEPHOTO LENS. AN



The Staley-Wheeler Con-Televertible photo Lens will do more than any other Tele. Lens offered up to the present time. The construction enables us to offer you a convertible system which will permit you to obamplifications. viz. 6 to 30 times

with a very short extension of camera, bellows, viz. (in half-plate size), of 15 inches, while the results obtained are greatly superior and the many advantages easily appreciated over the very long extension under the old system of from 40 to 60 inches, your camera and stand is more rigid and the focussing more easily done. They are specially advantageous for distant Landscapes, Mountain Scenery, Architectural, Military and Naval photography; also Balloon work. With a greater extension of camera they are capable of giving amplifications to 60 times. See descriptive matter in "British Journal of Photography," Sept. 27, pages 728-729.

Tele. Negative Attachments to 3-plate Lenses, 7 in. focus,

£6 6s. Od. Aluminium.

"ROYAL" REFLEX CAMERAS. 1910.



Reflex Cameras and Euryplan Lenses with every success. prices quoted, compared with other makers' models, are extremely moderate.

Without lens, and with 3 D.D. slides, 1-plate £10 10 0 5 × 4.. £11 10 0 P.C. .. £12 10 0 1-plate £15 0 0

The Self-Capping Focal Plane Nettel Cameras.

BUILT OF METAL THROUGHOUT. LEATHER COVERED

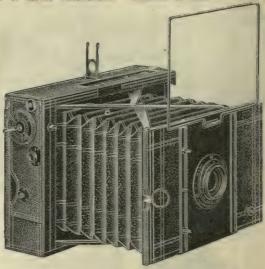
Proof against the great cold of the Polar Night, and not affected by the damp climate of Tropical swamps.

A system which guarantees perfect freedom from shock when making time exposures.

SIZES:

 $3\frac{1}{2} \times 2\frac{1}{2}$ $4\frac{1}{2} \times 3\frac{1}{2}$

5 × 4 6 × 4 3



Self-Capping Shutter. Speeds always remain the same, and are not affected by varying temperatures. Range from 1 sec. to 1/5,000th of a sec. Time and bulb exposures. Focussing. Rack and pinion actuating pointer, connected by lazy tongs. Reading from top of camera. An improvement over the old method of focussing mount. Shutter can be opened for focussing at once, no matter what speed it is set to. Camera works most smoothly, and such a system as this guarantees perfect freedom from shock when making time exposures. Can be ready for use in 5 seconds. Full frame view finder.

The few points dealt with above are sufficient to give an idea of the instrument referred to, and to show how adaptable it is for any class of work. The whole of the outer mechanism is arranged on one side of the camera, so that all operations can be carried out with one hand.

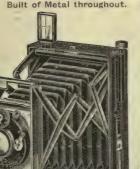
SIMPLE, RELIABLE, EFFICIENT, ELEGANT, AND DURABLE.

	Without	Fitted with	Fitted with	Fitted with		Double
Size	lens	f 6-8 Euryplan.	f 5-6 Euryplan.	f 4-5 Euryplan.	Film Dark	dark slides
Camera.	or slides.	No slides.	No slides.	No slides.	Adapter.	eshutters.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
$\begin{array}{c} 3\frac{1}{2} \times 2\frac{1}{2} \\ 4\frac{1}{4} \times 3\frac{1}{4} \end{array}$	6 0 0 6 15 0	9 0 0	9 10 0	11 5 0 12 10 0	0 14 0 0 15 0	0 9 0
5 × 4 68 × 43	6 15 0 8 0 0	11 0 0 12 15 0	11 15 0 13 15 0	14 5 0 16 15 0	0 15 0	0 11 0

Other Lenses may be fitted if desired.

THE FOLDING KIBITZ CAMERA.

Built of Metal throughout.



SIZES. -33 × 21. 41×31.

The Ideal Camera for the Amateur, as well as the ardent worker.

Leather covered.

These Cameras, by reason of their design, construction, simplicity, compactness, and perfectness in work, have become popular in every part of the world. They are not affected by climatic influence. They are constructed on thoroughly practical and scientific prin-ciples. They are the easiest to work on account of the simplicity of the focussing arrangement, a system hitherto not fitted to any Camera. Instead of being bothered by a focussing scale the register of distances is worked on side of Camera, thus it is always under observation. They are fitted with a front of the utmost rigidity, and one which cannot be strained or twisted. They have a rising front, and can be fitted w.th the most reliable between lens shutter, the compound and the famous Euryplan lenses of all series. They can be carried in the pocket without discom-fort. They are always ready for use, and focussing can be accomplished either Camera is closed or open.

Camera, 3½ by 2½, with no lens, but 6 Koerma single dark slides in case £3 10 0 8 15 0 14 Film pack adapter Camera, 41 by 31, no lens, but 6 Koerma single dark slides in case 0 0 4 With compound, $5\frac{1}{4}$ in. f/56 Euryplan and 6 slides in case... With compound, $4\frac{3}{4}$ in., f/68 Euryplan and 6 slides in case 10 15 15 0 16 Film pack adapter



THE STEREAX CAMERA.

The Stereax Camera is a production of clever ingenuity, and is unrivalled both in design, action, and in the fact that it is the smallest stereoscopic fitted with camera self-capping focal plane shutter. The shutter is identical with that of the self-capping Nettel, with the exception that

the speeds range from 1-12th of a sec. to 1-1200th.

The Camera is fixed focus, and when base board is released is imme-

diately in position, focussed, and with erected finder ready for use.

PRICE.-Complete with f/5.6 Euryplan Anastigmat lenses, 23" focus, and 6 Koerma dark slides in case Without lens, but with 6 slides in case . .

A. E. STALEY & CO., 19, THAVIES INN. LONDON, E.C. 19, THAVIES INN,

The Tropical Royal Reflex Cameras.



Built of Polished Teak, brass bound and pinned throughout, every joint dovetailed and glued.

EXTENSION.

Long extensions are fitted,

.. .. 11 ins. 5 × 4 .. 14 ins.

Postcard 17 ins.

Half-plate, 17 ins. thus enabling

long focus lenses and telephoto lenses to used, so that they are not restricted from anv class work.

REVERSING BACK.—This addition is most essential as it simplifies considerably the use of any camera. It is constructed so that it turns upon a circle, and is not detachable, and cannot be mislaid.

ADJUSTABLE MASK. - A most useful adjunct, and is the only camera so fitted. It works automatically with revolving back, so that when the back is in the horizontal position the mask on the top focussing screen is the same and vice versa.

The camera is built of the finest selected teak, a wood renowned for its great damp-and heat-resisting qualities, and is warranted to stand, without the slightest fear of warping or twisting, the most trying climates. Each joint is dovetailed and glued and a dowel pin driven through, thus making a joint which it would be difficult to sever.

Camera with three double block form slides but		Euryplan.	Nulli	Leather case (lined) to take Camera and 3 slides.		
without lens.	f/6 8. f/5.6		f/4·5.			
£ s. d. ½-Plate	19 10 0 24 10 0 28 10 0	£ s. d. 20 5 0 25 10 0 29 15 0 32 10 0	£ s. d. 22 15 0 28 10 0 32 10 0 35 5 0	£ s. d. 19 15 0 25 0 0 29 0 0 31 15 0	£ s. d. 1 0 0 1 15 0 1 15 0 2 0 0	

Antinous Release, 7/6 each. Schott Isochromatic Screens from 10/8 to 15/- according to size. Film Pack Adapters can be supplied if necessary.

FOLDING ROYAL REFLEX.



ing creen into position and is automatically locked when the end of the rack is reached, bringing the mirror and hood into position. The camera is finely

finished and leather covered: all principal parts are of metal to save bulk. It is fitted with rising front and

dust cap, which also acts as a sky-shade when the camera is ready for use.

The focal plane shutter is a new pattern, very simple and reliable: set by one complete turn of the setting pinion head.

0

The balance of the mirror has also been greatly improved, consequently the release is very light, thus preventing vibration. The alterations for the slit are made and indicated from the outside of the camera. This model is also fitted with our special revolving reversing back, and has a mask on the top focusing screen to indicate vertical or horizontal pictures, operated automatically by pressing the small nickel button on the top of the camera.

The rackwork and all parts of the camera are extremely rigid, and the shutter portion absolutely free from vibration.

We invite all those interested in this form of camera to this model before deciding on the purchase of a Reflex Camera.



CLOSED.

PRICES:

Camera without lens, but with 3 best quality D. D. slides, aluminium bound 15 With 6 in. f/4-5 Euryplan and 3 B Q slides ... With 6 in. f/5-6 Euryplan and 3 B Q slides ... With 6 in. f/6-8 Euryplan and 3 B Q slides ... With 6 in. f/6-5 Nulli Secundus and 3 B Q slides ... 22 10 20 0

O 19 5 19 10

The "Compound" Sector Shutter.

Maximum speed hitherto attained warranted to be effective to 1-250th of a second in the small size.

HTMOST ACCURACY OF REGULA-TION.

The most accurately speeded photographic shutter on the market.



STEREOSCOPIC SHUTTERS.

No. 0. Separation of lenses, 276, 3 or 3lin. .. £3 5 0

No. 1. Separation of lenses, 25, 3 or 3gin. .. £3 15 0

No. 2. Separation of lenses, 3gin. ...

£4 10 0

No. 0. Shutter is speeded from 1-250th second.

No. 1. Shutter is speeded from 1-150th-200th second.

No. 2. Shutter is speeded from 1-100th-150th second.

Larger sizes speeded to 1-100th second

The Automatic Compound Shutter is renowned World-wide for its great accuracy, simplicity in working, precision in manufacture and high efficiency. The speeds are regulated by an air brake, which is practically perfect, and avoids the defects of shutters fitted with leather friction brakes which are affected by every change of temperature, and unreliable. The working distance is so small, being 12 mm., that very short focus anastigmat lenses may be satisfactorily fitted. All internal parts are made of best steel, and the external casing is of aluminium, thus combining minimum weight and maximum durability.

It will, therefore, be seen that such shutters are unequalled for work abroad, as they are not affected by change of temperature, and can always be relied upon, all

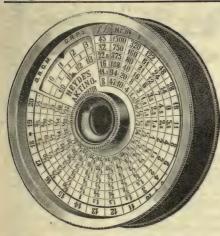
working parts being enclosed in a dust proof case.

A notable feature of the Compound Shutter is its efficiency, which is accounted for by the fact that instead of having two blades only, opening and closing according to the required speeds, it has 5 sectors in the small sizes, and 4 to 6 in the larger sizes. These open from centre, thus allowing the maximum amount of light to pass, and ensuring absolute equality of illumination.

Prices and Particulars of Shutters.

Size.	Iris aperture.	Tube diameter for lenses.	Outside measure- ment of shutter.	Price.
No. 0	13 in. or 20 mm.	1 tain. or 26mm.	23 in. or 55mm.	£1 15 0
,, 1	13 in. or 25 mm.	1 tain. or 30mm.	24 in. or 63mm.	2 0 0
,, JA	13 in. or 25 mm.	1 tain. or 35mm.	24 in. or 63mm.	2 2 0
,, 2	13 in. or 31 mm.	1 tain. or 40mm.	3 in. or 75mm.	2 8 0
,, 2A	14 in. or 31 mm.	1 tain. or 44mm.	3 in. or 75mm.	2 14 0
,, 3	15 in. or 42 mm.	2 tain. or 55mm.	38 in. or 85mm.	3 0 0
,, 4	2 in. or 5 mm.	2 tain. or 63mm.	4 in. or 100mm.	3 5 0

Heydes Facile Actino-Photometer.



The only Method of ensuring correct exposures under any conditions.

Visionary Test not depending upon varying rapidities of Meter Paper.

Suitable for any sight.

Complete Table for all
Lenses, with Apertures, from F/3 to
F/45.

Fitted with Shaded Prisms & Revolving Index.

Invaluable to Travellers

Indispensable to Amateurs getting Flat, Clogged and Muddy Pictures.

Amount Saved in Plates by using, would, in quite a short time, pay for itself.

A Necessity to Successful Photography.

It is impossible to speak too highly of this unobtrusive but useful little instrument, which is almost as important as the plate itself. There are numbers of amateurs who repeatedly affirm that they are unable to get on with this meter or that, and can never seem to get the percentage of good results they should.

This is not a very difficult matter to explain, as will be imagined, when one is dependent upon the action of light upon a sensitive surface, which possibly may be slowed down, either through age or other causes not easily determined.

The Heydes Actino-Photometer does not depend upon this means of deciding the actinic value of light, but by a scientific and visual method which cannot possibly fail. Usually, what we see we believe. This is so with the Heydes Meter.

COMPLETE IN LEATHER CASE, 18/6.

SOLE AGENTS:-

Lumière Plates...

(POPULAR PRICES)

AUTOCHROME PLATE. For direct Colour Photography. Simplified treatment. Reduced Prices (see page 18.)

NEW VIOLET LABEL PLATE.

The fastest in the world; fine grain; free frem tendency to fog. Wynne 142. Watkins 500. $\frac{1}{4}$ -plate, 1s. 3d.; $\frac{1}{2}$ -plate, 3s. 0d., etc.

SIGMA. Extreme Rapidity.

EXTRA RAPID. The Standard of Excellence.

ORDINARY. Medium Speed.

ORTHOCHROMATIC.

The most perfect Colour Sensitive Plates known.

LANTERN AND TRANSPARENCY.

For Black or Warm Tones (Two Varieties).

Films . .

ROLL FILMS

For all Cameras. Anti-H lation, Non-Curling, Orthochromatic. Wound in enamelled black paper (Planchon's Patent).

FILM BLOCK.

The most perfect form of film pack in existence. Fits any adapter.

PRICE LISTS POST FREE,

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12 × 10 Watson's "Premier," square bellows, double extension, new condition, 3 double dark slides, 2 cases, cost £24 10 × 8 " Optimus," square bellows, brass bound, double extension,	10	10	0
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slides, extensive rising front and double rack focussing, 2 best solid leather velvet-lined cases, a fine set, cost £20 8½ × 6½ Watson's "Acme," brass bound, turntable and tripod, 3	9	10	0
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slides, double rise to front and double rack for wide angle work, absolutely as new, cost £14 8½ × 6½ Studio by 'Hare,' best quality, swing back both ways.	6	15	0
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ways by rack, repeating double dark slide, cost £9 10s. 8½ × 6½ American Studio and Copying, in mahogany, two		10	0
repeating slides, all movements, cost £10. $6\frac{1}{2} \times \frac{43}{3}$ Ross "Special" Hand or Stand, leather covered, reversing back, swing front, three double dark slides, ebonized on	4	10	0
mahogany, brass bound, Ross changing box for 6 plates, leather case, cost \$15 6½ × 4½ Watson's "Premier," square bellows, double extension,	6	15	0
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3 double dark slides, case, cost £14 14s 5½ × 3½ "Videx-de-Luxe," by Adams, postcard size, fitted ½ plate	6	15	0
Zeiss Convertible Anastigmat, Series VIIA No. 7, reversing back, triple extension, focal plane shutter, 3 secs. to ratio and time, swing front, 3 double dark slides, Premo film pack			
adapter, solid leather velvet-lined case, new condition, cost £46 5 × 4 Shew "Delta," New Model, focal plane shutter, 3 double	27	10	0
dark slides, reversing back, Cooke Series III., F/6·5, 7½ focus in aluminium mount, leather case, cost £16 l0s 5 × 4 Zeiss Minimum Palmos, focal plane shutter, adjustable	11	17	6
outside, Ross' Homocentric 6 inch F/6·3, 3 double dark slides, Zeiss Film Pack Adapter, leather case, cost £15 4s	8	0	0
4½ × 3½ Adams "Idento," Zeiss Convertible Protar, No. 4, Series VIIA, between lens shutter, ½ sec. to ½ and time,			
detachable focal plane shutter, $\frac{1}{120}$ to $\frac{1}{1200}$, 6 double dark slides, film pack adapter, leather case, cost £25 42 × 34 Adams "Idento," fitted Ross Homocentric 5 inch F/6-3,	13	15	0
6 double dark slides, roll holder and case, cost £15 15s	8	17	6
mount, focal plane shutter, 5 sec. to robe and time, 3 double dark slides, leather case, practically new, cost £12 14s. 3½ × 2½ Blocknote, No. 2, Zeiss Tessar lens with iris, rising	7	15	0
front, focussing adjustment, 12 slides, film pack adapter, leather case, cost £16 15s	9	15	0

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Euryplan, F/4.5 by Staley, 7 in. in sunk mount, cost £8 15s. 6 Heliar, F/4.5, 7½ focus, sunk mount, with iris, cost £8 5s 5 1 Ross-Goerz Dagor, F/6.8, 7 inch in Unicum, cost £9 2s. 6d 6	15 17 10 17 10 15 15 17 17 17 17 17 17 17 17 17 17 17 17 17	0060600 06666
Goerz Dagor, Series III by Ross, 19 in. focus, cost £30	7 10 7 10 5 5 7 7 2 7	6 0 6 0 0 6 6
Ross-Zeiss, Series IV., Wide Angle Protar, 23\(\frac{1}{2}\) in., cost \(\xrt{\pm}18\) 9 1 Beck-Steinheil Orthostigmat, Series I., No. 9, 14\(\xrt{\pm}2\) in., cost \(\xrt{\pm}20\) 11 1 C.P. Goerz Dag r, No. 7, 14 in. focus, iris, cost \(\xrt{\pm}19\) 15 s 12 1 Ross, Symmetric Anastigmat, F/5c, 14 in. focus, iris, cost \(\xrt{\pm}17\) 10 1 Heliar, F/4-5, by Voigtlander, 11\(\xrt{\gamma}\) in. focus, iris, cost \(\xrt{\pm}12\) 12 and 23\(\xrt{\pm}1\) foci, iris mount with screen ring, cost \(\xrt{\pm}22\) 1. 12 and 23\(\xrt{\pm}1\) foci, iris mount with screen ring, cost \(\xrt{\pm}24\) 1. 15 1 Ross, Symmetric Anastigmat, F/5-6, 12 in. focus, iris, cost \(\xrt{\pm}13\) 7 1 C.P. Geerz, Celor, Series 1B., \(\xrt{\pm}2\) in focus, F/4-8, cost \(\xrt{\pm}95\) 5 2 1 Euryplan, F/4-5 by Staley, 7 in. in sunk mount, cost \(\xrt{\pm}85\) 5 5 1 Ross-Goerz Dagor, F/6-8, 7 inch in Unicum, cost \(\xrt{\pm}85\) 5 5 1 Ross-Goerz Dagor, F/6-8, 7 inch in Unicum, cost \(\xrt{\pm}95\) 5. 6. 6.	7 10 7 10 5 5 7 7 2 7	6 0 6 0 0 6 6
Beck-Steinheil Orthostigmat, Series I., No. 9, 144 in., cost £20 11 1 C.P. Goerz Dag r, No. 7, 14 in. focus, iris, cost £19 15s. 12 1 Ross, Symmetric Anastigmat, F/5-6, 14 in. focus, iris, cost £17 10 1 Heliar, F/4-5, by Voigtlander, 11g in. focus, iris, very fast, cost £18 11 1 Ross-Zeiss, Series VIIa., Convertible, No. 17, giving 12, 19½ and 23½ foci, iris mount with screen ring, cost £24. 15 1 Ross, Symmetric Anastigmat, F/5-6, 12 in. focus, kiris, cost £13 7 1 C.P. Goerz, Celor, Series 1B., 8½ in. focus, F/4-8, cost £9-5s. 6 Ross, 7½ in. Symmetric Anastigmat, F/8 with iris, cost £5. 2 1 Euryplan, F/4-5 by Staley, 7 in. in sunk mount, cost £8 15s. 6 Heliar, F/4-5, 7½ focus, sunk mount, with iris, cost £8 5s 5 1 Ross-Goerz Dagor, F/6-8, 7 inch in Unicum, cost £9 2s. 6d. 6	10 17 10 15 15 17 17 17 17	06000066
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Ross, Symmetric Anastigmat, F/5-6, 14 in. focus, iris, cost £17 . 10 1 Heliar, F/4-5, by Voigtlander, 11½ in. focus, iris, very fast, cost £18 11 1 Ross-Zeiss, Series VIIa., Convertible, No. 17, giving 12, 19½ and 23½ foci, iris mount with screen ring, cost £24. 15 1 Ross, Symmetric Anastigmat, F/5-6, 12 in. focus, iris, cost £13 . 7 1 C.P. Geerz, Celor, Series 1B., 8½ in. focus, F/4-8, cost £9-5s. 6 Ross, 7½ in. Symmetric Anastigmat, F/8 with iris, cost £5 2 1 Euryplan, F/4-5 by Staley, 7 in. in sunk mount, cost £8-5s 6 Heliar, F/4-5, 7½ focus, sunk mount, with iris, cost £8-5s 5 1 Ross-Goerz Dagor, F/6-8, 7 inch in Unicum, cost £9-2s. 6d. 6	5 .7 .7 .2 .7	0 0 0 6 6
Heliar, F/45, by Voigtlander, 11\(\frac{1}{3}\) in. focus, iris, very fast, cost £1\(\frac{1}{3}\) in. focus, iris, very fast, cost £1\(\frac{1}{3}\) in. focus, iris, very fast, cost £2\(\frac{1}{3}\) in. focus, iris mount with screen ring, cost £2\(\frac{1}{3}\). Ross, 8ymmetric Ansstigmat, F/56, 12 in. focus, iris, cost £1\(\frac{1}{3}\) in. Spymmetric Ansstigmat, F/8, in. focus, F/4\(\frac{1}{3}\), cost £9\(\frac{1}{3}\). C.P. Geerz, Celor, Series 1B., \(\frac{1}{3}\) in. focus, F/4\(\frac{1}{3}\), cost £9\(\frac{1}{3}\). Euryplan, F/4\(\frac{1}{3}\) by Staley, 7 in. in sunk mount, cost £8\(\frac{1}{3}\). Euryplan, F/4\(\frac{1}{3}\) focus, sunk mount, with iris, cost £8\(\frac{1}{3}\). S. Heliar, F/4\(\frac{1}{3}\) focus, sunk mount, with iris, cost £9\(\frac{1}{3}\) s. Ross-Geerz Dagor, F/6\(\frac{1}{3}\), inch in Unicum, cost £9\(\frac{1}{3}\) s. 6	5 .7 .7 .7 .7 .7 .7	0 0 6 6
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Ross, Symmetric Anastigmat, F/5·6, 12 in. focus, it is, cost £13 7 1 C.P. Geerz, Celor, Series 1B., $8\frac{1}{4}$ in. focus, F/4·8, cost £9·5s. 6 Ross, $7\frac{1}{2}$ in. Symmetric Anastigmat, F/8 with iris, cost £5. 2 1 Euryplan, F/4·5 by Staley, 7 in. in sunk mount, cost £8 15s. 6 Heliar, F/4·5, $7\frac{1}{2}$ focus, sunk mount, with iris, cost £8 5s. 5 1 Ross-Goerz Dagor, F/6·8, 7 inch in Unicum, cost £9 2s. 6d. 6	7 2 7	6
C.P. Geerz, Celor, Series 1B., 8½ in: focus, F;4·8, cost £9·5s. 6 Ross, 7½ in. Symmetric Anastigmat, F;8 with iris, cost £5. 2 1 Euryplan, F;4·5 by Staley, 7 in. in sunk mount, cost £8·15s. 6 Hellar, F;4·5, 7½ focus, sunk mount, with iris, cost £8·5s. 5 1 Ross-Goerz Dagor, F;6·8, 7 inch in Unicum, cost £9·2s. 6d. 6	7	
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Ross-Goerz Dagor, F/6.8, 7 inch in Unicum, cost £9 2s. 6d 6	0	Ö
		6
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Ross-Zeiss, Series VIIa., convertible No. 8, Goerz Sector Shutter,	_	
		0
Dr. Grun's Liquid Lens, F/2.5, iris, 6 in. focus, as new 2 1	8	6
Plastigmat by Bausch and Lomb, 61, F/6.8, Unicum, cost £7 10s. 3 1	0	0
	2	6
Cooke, Series III., F/6.5, 5 in. focus, iris, as new, cost £4 2s. 6d. 2 1		0
		6
Ross, Wide Angle, $F/16$, 20 in. focus, covers 32×26 , cost £30 12 1		0
Ross, No. 4, Wide Angle, 6 in. focus, covers 10 × 8, cost £4 10s 2 1		6
Dallmeyer, IAA Wide Angle, 4 in. focus, covers 7 × 5, cost £4 5s. 1 1		6
	0	0
Voigtlander, Collinear, Series IV., Wide Angle Casket of Three		
Anastigmats fitting one iris mount, giving 6 different foci, 61,		_
73, 87, 97, 127, 215 focus, cost £12 10s 6 1		0
Dallmeyer, 6A Patent Portrait, diffusion adjustment, cost £57 27 1		0
Voigtlander, Portrait Lens, 24 in. back focus, cost over £50 19 1		0
Voigtlander, Euryscope, 24 in. focus, No. 6, Series IV., cost £20 6 l	7	6
Ross, 4A Portrait, about 18 in. focus with rack, cost £36 9	5	0
Ross, 3A Portrait, 16 in. focus, a very fine lens, cost £26 7 1	0	0
Dallmeyer, 4D Patent Portrait, admirable for groups, cost £13 6 1	0	0
Dallmeyer, 3A Patent Portrait, 16 in. focus, rack focussing, cost £25 15 1	5	0
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Ross, No. 5 Ranid Caninet, 12 in, focus, perfect order, cost £18 fds. 9 f		
Ross, No. 3 Rapid Cabinet, 12 in. focus, perfect order, cost £18 10s. 9 1		6
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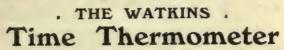
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"THE BRITISH JOURNAL OF PHOTOGRAPHY," March 15th, 1901, in "Correspondents Column," page 176, "Retoucher" writes: ". I enclose a few prints done by me during the six lessons. Perhaps you, Mr. Editor, will comment on them, and give your opinion as to the efficacy of the Postal Lessons." The Editor replied in a footnote to this question: "We congratulate both tutor and pupil. The specimens of work sent are very good indeed, and do the greatest credit to Mr. Bruce's method of Teaching by Post."

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10	× 8 Houghton's Sanderson, A quality, 3 double slides, stiff	O	10	U	
	canvas case, cost about £15 10s	8	0	0	
10	× 8 Perken, Son and Rayment Camera, 3 double slides, all				
0.1	brass bound, turntable and 3-fold stand, cost £13, very cheap	5	15	0	
85	× 6½ Camera by Morley and Cooper, 3 double slides, square	5	10	0	
81	bellows, stiff canvas case, best quality Spanish mahogany × 6½ Watson Acme, 3 double slides, Watson's R R lens, iris,	0	10	U	
02	3-fold stand and leather case, cost over £21	9	15	0	
81	× 6½ Watson Premier Camera, square bellows, 3 double slides,				
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	Ross Homocentric lens F/8 in Volute shutter, T.P. focal plane shutter and case, a bargain	11	0	0	
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- 2	stand, all in first-class condition and finest quality, a bargain,				
	cost over £14	6	0	0	
81	× 61 Sanderson "Compact Popular" form, Mackenzie-Wishart	6	5	0	
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02	slides, time and instantaneous shutter, turntable, 3-fold				
	stand, original model Focal Plane shutter, solid leather case,				
	all in very first-class condition, £14 10s	7	17	6	
63	× 43 Houghton's Triple Victo, 3 double slides, all brass bound, turntable, 3-fold stand, Thornton-Pickard Model A focal				
	plane shutter, leather case, all nearly new	6	0	0	
61	x 43 Hare Camera, 1 double slide, Hare changing box for 12				
_	plates, and slide for same, 2 leather cases, very fine quality,	_			
01	and has conical bellows, a bargain	3	15	0	
62	× 4 ³ / ₄ Sanderson best A Model, 6 double slides and canvas case, cost over £10, very nice condition	77	5	0	
61	× 44 Watson's Premier Camera, 3 double slides, all brass bound,		0	U	
2.0	solid leather case, as listed £12 17s., good condition	7	15	0	
63	× 42 Lancaster's Square Bellows Camera, double extension,				
	brass bound, 3 double slides, Lancaster Silver Ring Retigraph	4	0	0	
61	lens, 3-fold stand, 2 cases	-9	U	U	
02	tible Protar lens, giving foci 16½ in. × 14 in. × 8½ in., in Volute				
	shutter, 6 double slides all brass bound, best leather case,				
	very little used	22	10	0	
62	× 43 Newman and Guardia's special B, changing box for 12 plates, leather case, Zeiss, 2 foci, convertible Protar lens,				
	cost over £30	17	10	0	
61	× 43 Goerz Anschutz, Model A shutter, giving time as well as				
-2	inst. exposures, Dagor lens III., 3 double slides, changing		_		
	box for 12 plates, leather case	12	5	0	
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Koilos shutter, 3 plate holders, isochromatic screen and			
leather case	8	15	0
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Automat shutter, leather case, good condition	8	15	0
51 × 31 No. 34 Folding Pocket Kodak, Cooke lens III. in Unicum,			
leather case	7	5	0
5 x 4 Newman and Guardia's Universal Camera, Zeiss Tessar			
lens F/4.5, changing box for 12 plates, 3 double slides, 2 leather			
cases, as new, scarcely used	18	15	0
5 x 4 Goerz Anschutz, Celor lens, Model A shutter, 3 double			
slides and case, nice condition	8	17	6.
5 x 4 Goerz Anschutz, Tropical Model, Dagor lens, 6 double			
slides, roll holder for films, extension back, Goerz telephoto			
lens, 2 leather cases, cost £24, very good order	12	15	0
5 × 4 Zeiss Minimum Palmos Unar lens, F/5, 3 double slides,			
roll holder for films, film pack adapter, leather case, all in	_		
good condition	7	10	0
5 x 4 Newman and Guardia's Twin Lens, pair of Zeiss conver-			
tible Protar lenses, paired both for single and double com-			
binations, 2 changing boxes for 12 plates, leather case, cost	00		
£46	22	0	0
5 × 4 Adams Videx Reflex, Zeiss convertible Protar lens, 2 chang-			
ing boxes for 12 plates each, roll holder for films, pigskin case,	0.1	10	_
cost about £43 5 × 4 Marion's Soho Reflex, Beck's F/4.8 Isostigmar lens, 6 double	41	10	0
111 111 111 111 111 111 111 111 111 111 111 111 111 111	12	0	0
41 × 31 Newman and Guardia, Square Reflector Reflex, Zeiss	10	U	U
convertible Protar lens VIIA., 2 changing boxes, 1 double			
slide, binocular focussing eyepiece, Iso. screen, leather case,			
cost £42	27	10	0
41 x 31 Newman and Guardia Special B2 foci, as listed, £22 10s.		5	Ö
41 × 31 and 9 × 12 c/m Erneman Best Focal Plane Camera, Zeiss		-	
Tessar lens, F/6.3, 12 slides, film pack adapter, leather case,			
manus mine condition mond for turning	8	5	0
41 × 31 Zeiss Universal Palmos, convertible Protar lens VIIA.			
in compound shutter, 3 double slides, film pack adapter and			
leather case, nearly new, cost about £20	11	10	0
41 × 31 No. 3 Folding Pocket Kodak, Goerz Dagor lens III.,			
leather case, recent model		12	6
8½ × 6½ Dallmeyer 3A Patent Portrait, 16 in. focus, cost £26		10	0
81 × 61 Ross No. 3 Portrait, Waterhouse	6	10	0
10 × 8 Ross Portrait lens, early model, 18 in. focus, cost new £36,	10	_	
argain	10	0	0
Ross No. 3 Rapid Cabinet, 12 in. focus, fine condition, very	11	10	0
Dallmeyer 3B Patent Cabinet lens, 111 in. focus, cost	11	10	0
610 - 60-1	12	10	0
8½ × 6½ Ross No. 3a Portrait lens, 16 in. focus, early number,	14	10	U
but very good lens	8	10	0
8½ × 6½ Ross No. 2 Rapid Cabinet lens, 10 in. focus		0	0
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2B Dallmeyer, cost over £12		10	0

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10 × 8 Dallmeyer 4A Patent Portrait lens	, 18 in. locus, listed	10	_
£36 10s. 6½ × 4½ Vogel Cabinet lens, a good lens	17	10	0
Dellemann la C de W lang	2	5	0
Dallmeyer 1B C de V lens 15 × 12 Dallmeyer 6p, 24 in. focus with iris	a Analona nonvin	U	U
13 × 12 Danmeyer ob, 24 m. locus with lin	s, a line lens, hearly	0	0
new, cost £26 15s	ouhance stone mice	U	U
andition cost \$16 12s 6d	ernouse stops, nice	0	0
condition, cost £16 12s. 6d	6		0
10 × 8 Ross Universal Symmetrical, 14 in. f		U	V
good lang	6	15	0
good lens	4	0	ŏ
12 × 10 Watson and Sons' Premier F/6,	Universal lens for	0	0
Portraits or Groups. iris, listed new £15	5	10	0
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15 × 12 Dallmever's RR, iris	7	10	Ŏ
15×12 Dallmeyer's RR, iris 15 \times 12 Ross Rapid Symmetrical, Waterhous	6	10	0
12 × 10 Voigtländer Euryscope, with Waterh	ouse stons, a fine lens 4	10	0
12 × 10 Ross Rapid Symmetrical, iris	4	10	Ö
12 × 10 Dallmeyer RR, iris		5	0
13 × 11 Ross Rapid Symmetrical, iris		0	0
12 × 10 Taylor Hobson RR, iris, as new	4	15	0
12 × 10 Dallmeyer RR, Waterhouse	4	10	0
10 X X Dallmever RR, 1rls		15	0
10 × 8 Ditto, Waterhouse 10 × 8 Ross Rapid Symmetrical, iris 9 × 7 Ross Rapid Symmetrical, iris 8½ × 6½ Ross RS, iris stops 3½ × 6½ Dullmever RR iris	3	0	0
10 × 8 Ross Rapid Symmetrical, iris	3	10	0
9 × 7 Ross Rapid Symmetrical, iris	3	0	0
$8\frac{1}{2} \times 6\frac{1}{2}$ Ross RS., iris stops	2	17	8
$8\frac{1}{8} \times 6\frac{1}{8}$ Dallmeyer RR, iris	3	0	0
18 × 16 Ross Zeiss IIIA., focus 324 in., iris, c	ost £40 26	10	0
15 × 12 Goerz 1B Celor, Anastigmat, 19 in. focu	is, F/5, listed £33 15s. 21	0	0
12 × 10 Ross Goerz, Series III., 14 in., iris, a 10 × 8 Goerz, Series III., 12 in. focus 10 × 8 Gooke, Series V., 13 in., cost £10 9 × 7 Ross Zeiss Convertible Protar, Series	fine lens 13	17	6
10 × 8 Goerz, Series III., 12 in. focus	10	0	0
10 × 8 Cooke, Series V., 13 in., cost £10	7	5	C
9 x 7 Ross Zeiss Convertible Protar, Series	VIIA., No. 10, giving	10	_
foci 191, and 11 in., cost £20 9s. 9 × 7 Ross Goerz, 101 in., Series III., doubl	- A	10	0
	e Anastigmat, F/5.0,	5	0
as new		0	0
21 x 61 Dallmaray Stigmatic Sovies II No.		10	0
8½ × 6½ Dallmeyer Stigmatic, Series II., No. 8½ × 6½ Ross Zeiss Convertible Protar No. 1		10	0
81 × 65 Cooke, Series V., in nice condition		17	6
7 × 5 Bausch and Lomb Plastigmat, in Autom		5	0
9 v 5 Cloope Series III No 3 81 in	6	15	0
8 × 5 Goerz, Series III., No. 3, 8½ in. 8 × 5 Ross Unar Zeiss, 8½ in. focus, F/5, as n	ew 6	0	ŏ
8 × 5 Zeiss Convertible Protar, No. 10, V	IIA., giving foci of		
14 in and 8 in.	8	17	6
14 in. and 8 in 6½ × 4½ Goerz, Series III., F/6·8, in sunk mou	int 5	15	0
61 × 45 Set C of Bausch & Lomb Zeiss conve	ertible Protar leuses.		
containing 14 in., 112 in., and 9 in. lenses,	cost £14 15s., in case 9	5	0
, , , , , , , , , , , , , , , , , , , ,			

SANDS, HUNTER & CO.,

37, BEDFORD STREET, STRAND (Opposite the Civil), LONDON, Established at 20, Granbourne Street in 1874. W.C.

ROSS' Photographic Lenses & Cameras



TAKEN WITH

[Copyright.

ROSS' "HOMOCENTRIC" LENS.

5 in., Series III., f. 6'3.

ROSS LIMITED, &



Manufacturing Opticians.

Contractors to His Majesty's Governments, British and Colonial; also to the principal Foreign Governments.

ESTABLISHED 1830.

III, NEW BOND ST., LONDON, W. 31, COCKSPUR ST., CHARING CROSS, S.W. CLAPHAM COMMON, LONDON, S.W.

Wholesale Department and Optical Works:

Negative by Francis Bacon. 6-in. ROSS' "HOMOCENTRIC" LENS, f. 6.3. TAKEN WITH

* * ROSS' Patent * * HOMOCENTRIC LENS,



EXQUISITE DEFINITION,

PERFECT COVERING

AND ILLUMINATION,

Has called forth large numbers of appreciative letters, which space precludes; but the following extracts from voluminous laudatory testimonials give some idea of the value at which its merits are estimated:—

- "The finest lens brought out of recent years."
- "Has no equal for Critical Defining Power."
- "It is 'Unbeatable.' The Definition is superb."
- "By far the clearest and sharpest Photos are taken with the 'Homocentric' Lens."
- "Defining Power far finer than that of any other lens I have ever had through my hands."
 - "Definition over the whole plate is perfect."
 - "Perfect Definition at f5.6 with surprising Depth."
 - "Better than any lens for snap-shots of anything."
 - "The Definition, Rapidity and Covering Power are remarkable."
 - "Am much pleased with most satisfactory results."
 - "Brilliant Negatives with Details finely marked."
 - "Definite Advantages, exceeding even our Critical Expectations."
 - "A splendid Lens, especially for Colour Work."
 - "A powerful Lens. Tried it for various purposes."
 - "For Process Work there is nothing equal to it."
- "A Happy Combination of attributes—Perfection of Optical Qualities and Moderate Cost." [See following pages.

ROSS' HOMOGENTRIC

SERIES II. f/5.6 Stops:-f/8 f/11·3 f/16 f/22·6

SPECIALLY CONSTRUCTED FOR

PORTRAITS, CROUPS, INSTANTANEOUS PICTURES, AND SNAP SHOT HAND CAMERA WORK.



PLATE CO	OVERED.		IN FOCUSSING MOUNTS.
Equiv. Full	Medium	PRICE. In Iris Cod	Code
No. Equiv. Full Aperture.	Stops,	Setting. Wor	
Focus. Aperture.	Buops.	£ s. d.	£ s. d.
*00 3 inch 21× 15	2½× 2	4 15 0 Hahay	
	31× 31	5 5 0 Hahal	
1 5 ,, $4\frac{1}{4} \times 3\frac{1}{4}$	43× 3½	5 0 0 Haarle	
*0 5 ,, $3\frac{1}{2} \times 2\frac{1}{2}$ 1 5 ,, $4\frac{1}{4} \times 3\frac{1}{4}$ 2 $5\frac{1}{2}$,, $4\frac{3}{4} \times 3\frac{1}{4}$ 3 6 , 5 \times 4	5 × 4	5 10 0 Habes	
3 6 , 5 × 4		6 0 0 Hache	
	7½× 5	7 0 0 Hadda	
	$8\frac{1}{2} \times 6\frac{1}{2}$		n
$6\ 10^{\circ}\ , \ldots\ 8\frac{1}{2}\times\ 6\frac{1}{2}\ldots$			The Special Focussing
	12 ×10 1		
	15 × 12		
	18 ×16		Focussing Mounts do not
10 21 ,, 15 × 12 ×	22 ×18	38 0 0 Hakat	a admit of Between-lens
11 24 18 × 16 ×	25 × 22	17 10 0 Haleb	Shutters.
	* These len	ses work at f/4.8.	

Cost of Pairing two Lenses for Stereoscopic Work, 8/-

MOUNTED IN BETWEEN-LENS SHUTTERS.

	Equiv.		IN CENTEX.	IN COMPOUND.	
No.	Focus.		Price. Code Word.	Price. Code Word.	
1	5 inch	••	6 1 0 Haartex IN AUTOMAT.	7 0 0 Haarcom.	
2 3 4 5	5½ ,, 6 ,, 7 ,,		7 15 0 Habaur 8 5 0 Hackaur	7 10 0 Habcom. 8 8 0 Hackcom.	
5	7 ,, 8½ ,,	••	9 5 0 Haddaux 11 7 0 Hoelaux	9 14 0 Haddcom. 11 10 0 Hoelucom.	
	Equiv.		IN VOLUTE.	IN KOILOS.	
No.	Equiv. Focus.		Price. Code Word.	Price. Code Word.	
	Focus. 5 inch		Price. Code Word. £ s. d. 8 12 0 Haarval	Price. Code Word. £ s. d Haarkos.	
	Focus. 5 inch		Price. Code Word.	Price. Code Word. £ s. d 7 0.0 . Haarkos 7 18 0 . Habkos 8 8 0 . Hadskos.	
No. 1 2 3 4 5 6	Focus. 5 inch 5½ ,,		Price. Code Word. £ s. d. 8 12 0 Haarval 9 7 6 Habvaf	Price. Code Word. £ s. d 7 0 . 0 Haarkos 7 18 0 Habkos.	

The Lenses of this Series are specially recommended for all kinds of extremely rapid work for Portraits and Groups, also for Cinematograph work and Lantern projection.

HOMOCENTRIC LENSES.

f/6:3 Stops:—f/8 f/11:3 f/16 f/22:6. SPECIALLY CONSTRUCTED FOR

Instantaneous Views and Groups and Snap Shot Hand Camera Work.

		PLATE C	In Focussing Mounts.	
No.	Equiv. Focus.	Full Aperture.	Medium In Iris Code Stops. Setting. Word.	PRICE. Word.
000 00 0	2 ³ / ₄ inch 3 ¹ / ₂ "	2 × 2	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	£ s. d.
1	4 5 6 7	4½ × 3½	5 × 4 4 0 0 Heath	4 15 0 Hefta 5 0 0 Hegar 5 5 0 Hehnan
2 3 4 5 6	8½ ,, 10 ,,	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$7\frac{7}{2} \times 5$ 5 10 0 Hedon $8\frac{1}{2} \times 6\frac{1}{2}$ 7 0 0 Heeg 10 × 8 9 10 0 Hefra	6 5 0 Heida 8 0 0 Hekar The Special Focussing Mounts
7 Cost	of Pairin		$12 \times 10 \dots 12 \ 10 \ 0 \dots \ \mathrm{Hegron}$ s for Stereoscopic Work, 8s.	provided with Iris Diaphragm are for Hand Cameras of Fixed Extension. Focussing Mounts do not admit of Between lens Shutters.

MOUNTED IN BETWEEN-LENS SHUTTERS.

	Equiv.	In CEN	TEX.	In COM	MPOUND.
No.	Focus.	PRICE.	Code Word.	PRICE.	Code Word.
Ţ	5 inch	 5 1 0	Heathtex	 5 15 0 .	. Heathcom
2	5½ ,,	 5 6 0	Hebratex	 650.	. Hebracom
3	6 ,,	 5 11 0	Hectotex	 6 10 0 .	. Hectocom
		In AUT	OMAT.		
4	7 ,,	 7 15 0	Hednaux	 7 18 0 .	. Hedcom
5	81 ,,	 9 17 6	Heegaux	 9 14 0 .	. Heegcom
5	10 ,,	 12 7 6	Hefraux	 12 10 0 .	. Hefracom
		In VOLU	TE.		OILOS.
	Equiv.				
No.	Focus.	PRICE.	Code Word.	PRICE.	Code Word.
1	5 inch	 7 12 0	Heathval	 5 15 0 .	. Heathkos
2	51 ,,	 7 17 0	Hebraval	 6 5 0 .	. Hebrakos
3	6 ,,	 8 2 0	Hectoval	 6 10 0 .	. Hectorkos
. 4	7 "	 9 7 6	Hedvaf	 7 18 0 .	. Hedonkos
2 3 4 5	81 "	 10 17 6	Heegvaf	 9 8 0 .	. Heegkos
6	10 ,,	 13 17 6	Hefvaf	 	. 110081100
7	12 "	 16 14 0	TT		

The Lenses of this Series are admirably adapted for Hand Cameras. Their single combinations may be used for work requiring lenses of long focus, giving excellent results when used with medium stop on the same sizes of plates as the Doublets.

ROSS, Limited, 111, New Bond Street, London, W., and 31, Cockspur Street, Charing Cross, S.W.

Wholesale Department and Optical Works-CLAPHAM COMMON, S.W.

COMPOUND HOMOCENTRICS REVISED PRICES.

SERIES IV. f/6.8.

FOR

Out-door Work generally; for Views, Groups, and Architecture.



RATIO OF STOPS .. $f \mid 6.8 \ f \mid 8 \ f \mid 11.3 \ f \mid 16 \ f \mid 22.6 \ f \mid 32 \ f \mid 64$

		PLATE COVERED.				PRIC	E.	
3 6 4 7 5 8½ 6 10 7 12	cus. in '' '' '' '' '' '' '' '' ''	From 13 × 13 4 2 × 2 31 × 24 41 × 31 4 42 × 32 4 42 × 32 4 42 × 32 5 × 4 61 2 × 4 61 2 × 61 2 × 61 2 × 61 2 × 10 LA	To 3 × 2 3½ × 2½ 3½ × 3½ 6½ × 4½ 7½ × 5 7½ × 5 8½ × 6½ 10 × 8 12 × 10 15 × 12 18 × 16 ARGER SIZ	ZES	In Iris Setting. \$3 15 0 3 15 0 4 0 0 4 10 0 7 0 0 9 10 0 12 10 0 0 16 0 0 TO ORD	Code Word. Hylas Hylas Hylbo Hylcar Hylem Hymn Hypho Hypet Hykon Hybed Hysus Hytipe ER.	In Focussing Setting £4 15 0 5 0 0 5 5 0 0 6 5 0 8 0 0	Code Word. Hylot Hymot Hypot Hyrot Hykot

Cost of Pairing two Lenses for Stereoscopic Work, 8s.

MOUNTED IN BETWEEN-LENS SHUTTERS. IN CENTEX. IN COMPOUND. Equiv. Code Word. No. Focus. Price. Price. Code Word. 5 in. 1 1 Hylemtex £5 15 0 Hylemcom 3 51/2 6 Hymntex 22 5 0 Hymncom 6 5 11 0 Hyphtex 6 10 0 Hyphocom IN AUTOMAT. 7 15 0 Hypetaur 7 18 Hypetcom 91 5 83 Hykaux 9 14 17 0 Hykcom 33 12 7 Hybaum 12 10 0 Hybucom IN VOLUTE. IN KOILOS. Equiv. No. Focus. Price. Code Word. Price. Code Word, 5 in. Hylemval 1 £7 12 0 £5 15 0 Hylemkos 234 51/2 7 17 0 Hymnval Hymnkos 6 5 22 6 8 2 7 0 Hyphoval 6 10 0 Hyphkos 22 7 9 Hypetval 18 0 Hypetkos 81 ,, 10 17 Hykvaf 9 8

These excellent Rapid and Wide angle lenses are made to the same formulæ and replace our Series III. Double Anastigmats. They are specially recommended for wide Angle Work and for Copying, as they give uniform sharpness of the image from centre to margin of the plate, even with the largest stop.

HOMOCENTRIC LENSES.

SERIES V. f/8

FOR

Stops: $f/11.3 \ f/16 \ f/22.6$

Views, Groups, Interiors, Copying, and Hand Camera Work, with large Aperture.

No. Equiv.	PLATE C	OVERED.	PRICE In Iris.	IN FOCUSSING SETTINGS.
Focus.	From	То	£ s. d. Word.	Price Code £ s. d. Word.
1 5 inch	41 × 31	6½ × 4½	3 10 0 Hiata	4 5 0 Hinka
2 51	43× 31	7 × 5	3 15 0 Hibba	4 10 0 Hioto
3 6 ,,	5 × 4	71×5	4 0 0 Hicory	4 15 0 Hippos
4 7 ,,	6½ × 4¾	$8\frac{1}{2} \times 6\frac{1}{2}$	5 0 0 Hida	5 15 0 Hirado
5 81 ,,	7½× 5	10 × 8	6 0 0 Hiendel	The Special Focussing
6 10 ,,	$8\frac{1}{2} \times 6\frac{1}{2}$	12 ×10	8 0 0 Hiffar	Mounts Provided with
7 12 ,,	10 × 8	15 ×12	10 10 0 Higor	Iris Diaphragm are for
8 15 ,.	12 ×10		13 10 0 Hihone	Hand Cameras of Fixed
9 18 ,,	13 ×11		18 10 0 Hikur	Extension. Focussing Mounts do
10 21 ,,	15 × 12		24 10 0 Hileh	not admit of Between-
11 24 ,,	18 ×16	30 × 24	31 10 0 Himal	Lens Shutters.

Cost of Pairing two Lenses for Stereoscopic Work, 8s.

MOUNTED IN RETWEEN LENS SHITTERS.

		M	OUN.	TEL	IN I	BETWEEN-L	ENS	SHUT	TEI	RS.	
			· IN CENTEX.						IN	CON	IPOUND.
No.	Equiv. Focus.		Pri	ce.		Code Word.		Price	е.	^	Code Word.
			£ s.	d.				£ 8.	d.		
1	5 inch		4 11			Hiatter		5 5	0		Hiatcom
2	51 ,,		4 16		• •	Hibtex Hicatex	• •	5 10	0	• •	Hibbeom
2 3 4	6 ,,	• •	5 1	0	• • •	Hidatex		5 15 7 0	0	::	Hiccom Hidacom
7	4 17	• • •	0 .	IN	ATITIO	OMAT.	•••	, ,		• • •	2210400111
5	81,,		8 5		HOI	Hindlaur		8 8	0		Hiencom
	10 ,,		10 17			Hiffaux		12 14	Ö		Hiffscom
7	12 ,,		13 7	6		Higraux		13 10	0		Higocom
]	N VO	LUTE.			I	N KC	DILOS.
No.	Equiv. Focus.		Pric			Code Word.		Price			Code Word.
			£ s.			***		£ s.	d.		****
1	5 inch	• • •	7 2	0	• •	Hiatval Hibbaval	• •	5 5 5 10	0	• •	Hiatkos Hibbakos
- 3	5½ ,,	• • •	7 12	0		Hicval		5 10 5 15	ő		Hickos
3 4	7 "	• • •	8 12			Hidaval		7 0	0		Hidakos
5	81 ,,		9 17	6		Hindvaf				-	
	10 ,,		11 17			Hiffvaf					
7	12 ,,		14 7	0		Higorvaf				-	

The Single Combinations of the Homocentric Lenses may be used for work requiring lenses of long focus. They give excellent results when used with medium stop on the same size of plate as the complete combination for distant Landscapes.

ROSS, Limited, 111, New Bond Street, London, W., and 31, Cockspur Street, Charing Cross, S.W.

Winolesale Department and Optical Works-CLAPHAM COMMON, S.W.

HOMOGENTRIC LENSES.

SERIES VI. f/8 Stops: f/11·3 f/16 f/22·6 f/32 f/45 f/64

The Lenses of this series are mounted when required in special settings with Iris Diaphragm as well as slot for Waterhouse stops. Diaphragms with square or special form openings can be supplied as an extra.

For Process, Line, Half-Tone, and Three-Colour Work.

			In setting with	
	Equiv.	Large	Smaller Iris or Water-	Code
No.	Focus.	Aperture.	Stops. house stops.	Word,
			Up to £ s. d.	
7	 12 inch	10×8	15×12 10 10 0	Hoang
8	 15 ,,	12×10	18×16 13 10 0	Hobart
9	 18 ,,	13×11	22×18 18 10 0	Hocher
10	 21 ,,	15×12	25 × 22 24 10 0	Hodder
11	 24 ,,	18×16	30×24 31 10 0	Hoei

THE HOMOCENTRIC LENS, from its complete zoneless spherical correction, freedom from astigmatism and curvature, is specially adapted for all Process work, including that in Three Colours. The most delicate work is copied, reduced or enlarged by it with absolute accuracy and sharpness.

ROSS' WIDE-ANGLE LENSES. 1/16.

For Landscapes, Architecture, and use in Confined Situations.

No.	Size of Plate with medium	Size of Plate with	Equ.	PRICE.	Code Word.
No.	Stop.	full Aperture.	Focus.	Brass Settings.	Code Word.
*1 *2 *3 4	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} 4\frac{1}{4} \times 3\frac{1}{4} \\ 5 \times 4 \\ 6\frac{1}{2} \times 4\frac{3}{4} \\ 8\frac{1}{2} \times 6\frac{1}{2} \end{array}$	3 ins. 4 ,, 5 ,, 6 ,,	3 0 0 3 5 0 3 15 0 4 10 0	Ladas Lebanon Levant Lexicon

These Lenses are remarkable for the sharp definition given over the whole of the plate covered with equal illumination and their freedom from distortion.

They are constructed for 90° and upwards, a wider angle, perhaps, than given by any wide-angle lenses hitherto issued.

They are confidently recommended for architectural subjects and for use in confined situations.

Rotary Diaphragms only are supplied, as there is not sufficient space between the front and back combinations to introduce the Iris Diaphragm.

£26_0 0

ROSS'



NO. 3 CABINET LENS.

Cabinets in long Studios

RAPID

"Cabinet" and

Portrait Lenses.

FOR THE STUDIO.

Ross' "Cabinet" Lenses differ from ordinary Portrait Lenses in being constructed to give as flat a field as is consistent with good marginal definition. They are invaluable for the production with full aperture, of either standing or sitting figures, Heads, Busts, and Groups, and give very rapid results with brilliancy and exquisite defining power.

The prices quoted are for the lenses mounted in Rigid CODE WORDS. Setting, with Iris Diaphragm. Iris Diaphs. No. 1 Cabinet Lens, 23 inches clear aperture, 81 inches & Rigid Setting. equivalent focus; for Cabinet Pictures in short studios; should be placed 14 feet from the sitter, Quagris 18 feet for full length Carte-de-Visite Portraits ... £12 0 0 No. 2 Ditto ditto, 31 inches clear aperture, 10 inches equivalent focus; recommended where there is not Queris sufficient space for the use of a lens of longer focus; £16-10 0 should be placed at 18 feet from the sitter ... No. 3 Ditto ditto, 31 inches clear aperture, 12 inches equivalent focus; for use when the studio exceeds Quivris 20 feet; should be placed at 20 feet from the sitter £18 10 0 for Cabinet Portraits ... Many of the finest Cabinet portraits from leading Studios in Paris, London and New York are taken with this No. 3 Lens. No. 3A Portrait Lens, 4 inches diameter of lenses, 16 inches equivalent focus, for pictures on $8\frac{1}{2} \times 6\frac{1}{2}$ Quiltris plates and under, for Promenade Portraits and

ROSS, Ltd., 111, New Bond Street, London, W., and 31, Cockspur Street, Charing Cross, S.W.

LARGER SIZES TO ORDER.

Wholesale Department and Optical Works-CLAPHAM COMMON, S.W.

ROSS-ZEISS "TESSAR,"

These Lenses are perfectly corrected for Astigmatism.

No. 1 and No. 1a are specially for Cinematograph work, and we therefore only stock them with Focussing Adjustment.

The longer fooi are for Portraiture, possessing about the same rapidity as Lenses of the Petzval Type and a flat field of 35°.

			PF	RICE.
No.	Equivalent	Plate	Brass	Mount.
No.	Focus.	Covered.	With Iris Diaphragm. Code Word	With Focussing Adjustment.
1 1a 6 7 8	m/m inches. 50 2 75 3 210 8½ 250 10 300 12	1 by \(\frac{3}{4} \), \(\frac{1}{6} \), \(\frac{2}{4} \), \(\frac{3}{4} \), \(\frac	£ s. d. 4 0 0 Adecenar 5 0 0 Adecuno 15 0 0 Adebant 20 0 0 Adendrus Adendrus Aderant	£ s. d. 4 15 0 Adecto 5 15 0 Adnoto

ROSS-ZEISS "TESSAR,"

SERIES 1c. f4.5.

The **f 4.5** "**Tessars**" are preferable for Group and General Portrait work, the smaller sizes affording increased possibilities to users of hand cameras with focal plane shutters.

27-	Equivalent		Plate		PRICE. Brass Mount.						
No.		cus.	Covered.	With Iris Diaphragm.			CODE WORD.	Fo	With cussing ustment.	CODE WORD.	
13 15 15a 16 17 18 18a 19 19a 20	m/m 112 150 180 210 250 300 370 400 450 500	10 12 143 16 18 20	3½ by 2½ 4½ 3½ 6½ 4½ 58 58 59 6½ .	8 10 16 22 30 35	s. 0 10 0 0 0 0 0 0	d. 0 0 0 0 0 0 0	Adisti Afaglid Afagia Afesios Agerant Agistis Asdut Asadas Asocon Asais	£ 5 7 9 11	s. d. 10 0 2 0 0 0 0 0	Asaron Adheso Alaar Alanto	

The cost of pairing two Lenses for Stereoscopic Work is 8s.

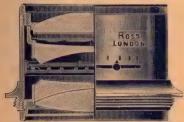
THE ABOVE PRICES ARE NET.

ROSS, Limited, 111, New Bond Street, London, W., and 31, Cockspur Street, Charing Cross, S.W.

Wholesale Department and Optical Works-CLAPHAM COMMON, S.W.

ZEISS' "TESSAR" LENSES, MANUFACTURED BY ROSS, Limited.

SOLE LICENSEES FOR THE BRITISH EMPIRE.



Exquisite Definition and large flat Field are the specially marked characteristics of the three Series of "Tessars."

Series Ilb., f6.3.

A HIGH-CLASS ANASTIGMAT FOR ALL PURPOSES.

These Lenses are perfectly corrected for Astigmatism and embrace a large angle. The Smaller Sizes are specially suitable for Hand Cameras.

		valent	Plate Covered.			PRICE.							
No.	m/m	Inches.	F	rom			То		With Iris Diaphragm.			Code Word.	
1a 2 3 4 5 5a 6 7 8	75 84 112 136 155 180 210 255 305	3 356 48 51 6 710 81 10	2* 3½ 4¾ -5 6½ 7	× 2 × 2 × 3 × 4 × × 5 × 5	34	31/2 31/2 4 5 6 7 81/4 91/2	× × × × × × × × ×	21 21 21 318 4 43 5 5 61 71	£ 4 4 4 4 5 7 8 11 17	8. 0 0 10 15 0 0 10	d. 0 0 0 0 0 0	Adescando, Adescantis, Adescarent, Adescassi, Adescavamo, Adeschero, Adesco, Adesivo, Adesmie.	

Larger Sizes to Order.

Series 11b.

In Focussing Mounts for Hand Cameras with Fixed Extension.
In Between-lens Shutters.

	Equivalent Focus.	PRICE. In Between-lens Shutters.							
No.	Inches.	In Focussing Mount.		In	In Volute.	In Koilos.			
4 5 5a 6 7	51 6 710 81 10	£ s. d. 5 5 0 5 10 0 7 12 0	£ s. d. 6 10 0 6 15 0 9 3 0 11 4 0 14 10 0	£ s. d. *5 16 0 *6 1 0 9 5 0 11 7 6 14 7 6	£ s. d. 8 7 0 8 12 0 10 17 6 12 7 5 15 7 6	£ s. d. 6 11 0 7 0 0			

*These two sizes are in the new B. & L. Automat Shutter—The "Centex."

The cost of pairing two Lenses for Stereoscopic work is \$s.

Objectives with focussing mounts cannot be used in conjunction with Hand

Cameras where the shutter works between the lenses of the objective.

THE ABOVE PRICES ARE NET.

SERIES VII., f. 12.5,

(ZEISS' PATENT.)

CONVERTIBLE SINGLE 'PROTAR' LENSES

Manufactured by ROSS, Ltd.



(Sole Manufacturing Licensees for the British Empire.)

The anastigmatic flatness of the image is unapproachabe in any bingle Landscape Lens hitherto produced, while the marginal distortion is practically inappreciable. The Lens is therefore suitable for instantaneous outdoor pictures such as landscapes and seascapes, and also for large portraits and groups in a good light.

The field embraced is about 85°. Stops-f12·5, f16, f22·6, f32, f45, f64.

No.	Equivale	ent focus.	Plate co	vered, f 12.5.	Price with Iri Diaphragm.	Code Word.
0 00 000 1 2 3 4 5 6	mm. 100 135 170 183 224 285 350 412 480 590	Ins. 4 5 6 6 4 7 1 11 14 16 19 19 12 14 16 19 19 19 19 19 19 19 19 19 19 19 19 19	c.m. 6× 9 7×10 9×12 12×15 13×18 16×21 21×27 24×30 29×34 30×40	$\begin{array}{c} \text{Ins.} \\ 3\frac{1}{2} \times 2\frac{1}{2} \\ 4 \times 2\frac{3}{4} \\ 4 \times 2\frac{3}{4} \\ 4\frac{3}{4} \times 3\frac{3}{4} \\ 6\frac{1}{2} \times 4\frac{3}{4} \\ 7\frac{1}{2} \times 5\frac{1}{2} \times 6\frac{1}{2} \\ 10 \times 8 \\ 12 \times 10 \\ 13 \times 11 \\ 15 \times 12 \end{array}$	£ s. a. 4 10 0 4 10 0 4 10 0 3 15 0 5 0 0 6 0 0 7 15 0 10 15 0 13 15 0	Abdera Absynth Abydos Acacia Acarina Aceton Achilles Acidalia Aconitum Adinol

SERIES V., f. 16,

Zeiss' "Protar.

MANUFACTURED BY

ROSS, Ltd.,

Sole Licensees for the British Empire.

Stors—F/16, F/22, F/32, F/45, F/64. The first seven sizes are specially useful for interiors, or work in confined situations. The three larger sizes are specially intended for the reproduction of maps, plans, and drawings; they yield a perfectly flat and anastigmatic image, and are entirely free from distortion. The field measures in the smaller numbers over 100°, in the larger ones about 90°.

No.	Equivale	nt focus.		stop. F/32.	Price.	Code Word.
1 2 3 4 5 6 7	112 141 182 212 265 315	in. 34 44 55 74 84 102 124	Ins. 4\frac{4}{4} \times 3\frac{1}{4} 5 \times 4 6\frac{1}{2} \times 4\frac{3}{4} 8\frac{1}{2} \times 6\frac{1}{2} 10 \times 8 12 \times 10 13 \times 11	Ins. 5 × 4 6½ × 4½ 8½ × 6½ 10 × 8 12 × 10 13 × 11 15 × 12	£ s. d. 3 4 0 3 4 0 4 0 0 5 0 0 6 5 0 7 15 0 9 5 0	Labrador Lagune. Lama. Lapsus. Lateran. Lava. Lawine.

SERIES VIIA.

(Zeiss' Patent.)

CONVERTIBLE 'PROTAR' LENSES,

F: 6'3 to F: 8.

Universal Series of Lenses specially suitable for Portraits and Groups in the Studio, and for all Classes of outdoor Photography, also for Interiors, Copying, &c.

Made by ROSS, Limited, Sole Manufacturing Licensees for the British Empire.

These Lenses are formed by combining suitable single Lenses of Series VII. (f/12.5), as described on the preceding page.

	Co		of Two L f/12'5)	enses.	Size of Plates.	Prices in London.		
No.	Соп	Resulting nbined Fo	cus.	Largest Aperture.	At Full Aper- ture, Inches	In Brass Settings, with Iris.	Cable Code Word	
	Front	Back	ins.	reportates		£ s. d.		
0 000 000 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 22 25 28 30	4 588644 9 112 9 114 14 164 164 194 16 194 16 194 17 2 27 27 27 27 30 34 39	4 9 9 9 1112 14 14 16 16 19 19 19 19 19 19 19 19 19 19 19 19 19	28 4 4 4 5 5 5 3 4 4 4 5 5 5 5 6 6 7 7 5 8 8 1 9 9 4 10 11 11 2 2 4 4 5 5 5 13 4 5 5 5 6 6 7 7 5 8 8 1 5 9 1 4 1 1 1 2 2 3 5 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 7 1 1 1 1 1 2 2 3 5 6 6 6 7 1 1 1 1 1 2 2 3 5 6 6 6 7 1 1 1 1 1 2 2 3 5 6 6 6 7 1 1 1 1 1 2 2 3 5 6 6 6 7 1 1 1 1 1 1 2 2 3 5 6 6 6 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	6-3 6-3 6-3 7 8 6-3 7 8 6-3 7 8 6-3 7 8 6-3 7 8 6-3 7 8 6-3 7 8 6-3 7 8 6-3 7 8 6-3 7 8 6-3 7 8 8 6-3 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	1½ × 22 8 4 4 4 5 5 × 4 5 5 × 4 5 6 6 ½ × 5 5 6 4 4 7 8 4 × 6 6 ½ × 5 5 6 4 4 7 8 4 × 6 6 ½ × 5 5 10 × 8 8 10 × 8 8 10 × 8 8 10 × 8 8 10 × 10 12 × 10 12 × 11 15 × 12	8 5 0 8 5 0 8 5 0 8 5 0 7 5 0 8 0 0 7 15 0 9 10 0 9 10 0 9 10 0 11 19 0 11 19 0 11 12 0 11 12 0 11 12 0 12 12 0 20 12 0 20 20 23 9 0 23 15 0 30 2 0 33 15 0 61 14 0 81 5 0	Accord Agathe Agnes Agonie Alabaster Alauda Albatros Alizarin Alkaloid Alkohol Amiuon Ananas Anchovis Anilin Anthracit Antimon Antipyrin Apostat Aristos Asbest Athene Atlas Atropin Aurora Aurum Ave Azzalie	

More than two single lenses may be used in the same setting, the size of which is determined by the longest focus single lens. A movable Ring must be adapted, so constructed that the engraving indicates 3 to 6 Scales of apertures as the case requires. Price of Ring with 3 scales, 7s. 6d.; with 6 scales, 10s. For engraving additional scales on customer's own lens Rings 2s. 6d. will be charged for each scale.

For SETS OF CONVERTIBLE "PROTARS" see Ross' Complete Catalogue.

ROSS, Limited, 111, New Bond Street, London, W., and 31, Cockspur Street, Charing Cross, S.W.

Wholesale Department and Optical Works-CLAPHAM COMMON, S.W.

ROSS' Tele-Photographic Lenses.

A TELE-PHOTOGRAPHIC Combination consists essentially of a Positive lens and a Negative lens, the focus and consequent magnification of the image being regulated by their

relative positions.

Were the Separation equal to the difference of their focal lengths a telescopic combination would be formed, or if the separation were equal to the focus of the positive lens no magnification would take place, but all approximation from this point lengthens the focus enlarging the image. To obtain the necessary adjustments a setting with rack and pinion is provided in several sizes to suit various positive and negative lenses.

Any good photographic objective may be used in conjunction with tele-negative lenses, but the "Homocentric" is specially recommended, and it is to utilize to the full the excellent qualities of this lens that the Ross' Tele-negatives have been specially

constructed.

Negative 13 in. focus. .

99

22

21 in.

in. ,,

in.

5 in.

9

16

29 ..

19 --

The tables given show the various magnifications, the extensions of camera bellows, and the prices of the settings & negative lenses.

Homocentric		0.01					ive L
moce minimum			TELE-PHOTO TTACHMENT				Negative
Ť			0.5		/		-
Setting No. 1 fo	m Docitivo	Longos	flance no	bassas	ing 11 in	diameter	Price.
NT - O					la in.		2 17 6
,, No. 3	99	99	**	99	2 in.	11	3 2 6
No Zo	77	"	11	99	2½ in.	9.9	3 7 6
DI a A	22	73	27	"	24 in.	17	3 12 6
No An	22	11	21	22	24 in.	9.9	4 0 0
No E	22	37	22	99	3 in.	9.9	
No 6	99	9.9	2.9	2.9	3½ in.	99 '	4 10 0
	one 11 in	500000 0	witable to	m Classina		70	5 5 0
Tele-negative I			urtable 10			larger .	1 10 0
33 1	, 13 in.		39	99	No. 1	99 4	1 15 0
99 1		91	19	99	No. 1	22 .	
39 1	, 3 in.	22	22	19	No. 3	77 .	. 3 50
39 3		22	33	99	No. 4	25 *	. 5 5 0
"	" 5 in.	2.2	91	99	No. 5	,, .	7 15 6
Approxima	te Exten:	sions fi	om Neg	ative Lo	ens to Fo	cussing	Screen.
Magnificatio		5	6	7	8		able for

Extensions for lower or higher magnifications are proportionate to the above. LARGER SIZE SETTINGS AND NEGATIVE LENSES OF LONGER FOCUS SPECIALLY CONSTRUCTED TO ORDER.

18

24

 $\frac{11^{\frac{7}{4}}}{15}$

20

 $3\frac{1}{2} \times 2\frac{1}{2}$ to 5×4 .

1-plate to 1 plate.

a-plate to 10 × 8.

5×4 to whole plate.

whole-plate to 12×10 .

15%

28

THE LATEST SELF-CLOSING FOCAL-PLANE CAMERA.

Made throughout at Ross' Optical Works, Clapham Common.

ROSS' "PANROS"



Is the most perfect form of Hand Camera and has been constructed to meet the demand for a folding camera of the highest class suitable for all requirements of up-to-date photography.

It will be found reliable under all circumstances, and efficient in every emergency that is likely to arise.

The "PANROS" is compact and of convenient size, light in weight, and easy of manipulation. Its freedom from mechanical complication, combined with most careful construction, is such that it cannot be easily deranged or damaged without unduly rough usage.

The Framework is of thoroughly seasoned, ebonized hard wood, all external parts, front and back, being finished with a dull black polish, while the body, which contains the shutter, is covered with best quality morocco leather.

The appearance is therefore extremely trim, compact and unobtrusive; and the lens being sunk almost level with the front, the Camera is very portable in a light case of leather or canvas of small size.

The Bellows is of the form ordinarily used in portable cameras, and not flat, as in many of the collapsing cameras of recent introduction. In consequence internal reflections are out off by the block and tolds of the bellows.

The Front is held extended perfectly rigid and parallel to back, by means of very strong struts or stays, which automatically lock themselves into position by the simple action of drawing out the Front.

ROSS' "PANROS"

PATENT -

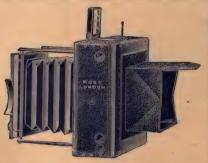
FOCAL-PLANE CAMERA (continued).

The Lens Board has extensive rise and fall, so that the foreground may be limited, and high buildings or monuments included in the picture.

A Cross Movement is also provided for horizontal pictures.

One Winding Head sets the shutter, and regulates for time and instantaneous exposures of varying duration, so that the camera is without any other external projection. It is unlike other cameras in this respect as also in the advantage of re-adjustment of the blinds for speed either before or after setting the shutter.

One of the most important features of the "Panros" Camera is the Patent Focal-Plane Blind Shutter. It has the highest efficiency, and is more easily adjusted than any other hitherto introduced. There are two short blinds, winding from one roller on to another, without any strain beyond the tension of the Springs.



In many shutters the blinds are connected by silk tapes, and the variation of aperture is accomplished by winding one blind away from the other, producing considerable friction and strain, which wear the tapes. Moreover, this arrangement does not admit of the aperture being adjusted in one position. In the Ross "Panros" one blind begins to travel first, and after an interval, sufficient to attain the desired aperture, the second blind automatically released, follows.

The mechanism connected with the two blinds then, by means of a novel form of clutch, becomes locked in such a manner that the distance

between the edges of the blinds remains constant during the whole time the blinds are in motion, and there is no possibility of any alteration in the width of aperture during exposure. The increase or decrease of exposure value is shown by the indicator, and is controlled by the one and only milled head, the actual speed of blind travel being automatically increased as the aperture is decreased.

The Instantaneous exposures range from of $\frac{1}{10}$ to $\frac{1}{1000}$ of a second.

Automatic exposures of $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, 2 and 3 seconds or prolonged Time, may be given by pneumatic ball release, and, a certain speed having been used, there is no need to re-adjust before making a second exposure at the same speed.

The Shutter Blinds are self-closing, that is one blind overlaps the other and remains in this position during the next setting of the shutter, so that should the slide of plate-holder be withdrawn, no light will reach the sensitized plate or film. In other focal-plane shutters of fixed aperture the slide must, to avoid fogging, be re-inserted in the carrier, should it have been withdrawn before the shutter is set, or else recourse must be had to a lens-cap which is liable to be forgotten.

ROSS' "PANROS"

PATENT

FOCAL - PLANE CAMERA (cor

(continued).



OPENING THE BLINDS FOR FOCUSSING.
SETTING THE SHUTTER FOR SPEED.
WINDING FOR EXPOSURE.

The Winding Head, the only one projection on the "Panros" Camera, accomplishes all operations

usually allotted to divers milled heads and other arrangements, extending beyond the framework of hand cameras. The head when drawn out slightly and turned while in that position brings the arrow-head

opposite the speed figure on the dial. The head automatically returns to its normaposition. This setting of speed may be effected before or after the winding of the shutter. Working within the head is a Butterfly nut, a half-turn of which opens the blinds for focussing purposes. To release and return blind to normal position before setting, give the outer head a slight turn first forward as if to wind and then backwards. The blind will return to its position ready for setting. Half a turn of the head is all that is necessary to wind and set the shutter for exposure. This winding brings the blinds into position for working.

The Mechanical Working Parts of the Shutter are entirely concealed in a small internal space, and from their design and the great care taken and exactitude in putting together they are not at all liable to get out of order.

The Finder attached to the Camera is a folding concave glass, reproducing in miniature the picture to be taken with the lens. Being ruled with cross lines and supplied with a centering sight, it is easy to see if the camera is being held straight.

The camera is furnished with a Hood for focussing, which also acts as a protector for the glass screen.

The Changing Box made for the "Panros" Camera is of similar high finish to the Camera, and is morocco covered. It is for 12 plates or 24 films, carried in sheaths. It is extremely simple and efficient, and slides into the back grooves of camera without the least difficulty. The exposure is made by the withdrawal of the roller shutter, and the return of the shutter pushes the exposed photo or film in sheath into the leather bag, whence it is transferred to the back of the pack. The non-actinic window in the box lid permits of the bold legible numbers on the back of the sheaths being read with ease.

ROSS, Limited, 111, New Bond Street, London, W., and 31, Cockspur Street, Charing Cross, S.W.

Wholesale Department and Optical Works-Clapham Common, S.W.

ROSS' "PANROS"

PATENT

FOCAL - PLANE CAMERA (continued).

	1	1	
Prices of ROSS' "PANROS"	1-plate with 5 in, lens.		Post card
Cameras.	5 in. lens.	6 in. lens.	6½ in. lens.
"PANROS" Focal-plane Camera with Ross' Patent "Homocentrio" Lens, Series III., f/6'3, in focussing Mount,	£ s. d.	£ s. d.	£ s. d.
adjustable Focal-plane Shutter for time or Instantaneous Exposures, three	Code Word	Code Word	Code Word
solid Double Dark Slides and Black	Pandus	Pandora	Pancreas
Leather carrying case	12 17 6	14 0 0	14 10 0
Ditto, with "Homocentric" lens, Series IV., f/5.6 instead of Series III.	Pango	Pangoat	Pangolo
Ditto, with "Homocentric" lens, Series II.	12 17 6 Panmaur	14 0 0 Pancrate	14 10 0 Pancrule
f/5.6 instead of either of the above	13 17 6	15 0 0	17 5 0*
Additional Double Dark Slides each	0 12 6	0 13 0	0 14 0
Changing Box with 12 Sheaths	1 15 0	2 0 0	2 10 0
Holder to take Premo Film Pack Mackenzie-Wishart Daylight Slides, Model	0 15 0	0 18 0	0 18 0
B each	0 15 0	0 18 0	0 18 0
Envelopes for ditto	0 1 6	0 2 0	0 2 0
Antinous Release, specially fitted	0 4 6	0 4 6	0 4 6
Best quality Leather Sling Case, to hold Camera and three Double Dark Slides.			
extra	0 10 6	0 12 6	0 12 6
Ditto to hold Camera and six Double Dark			
Slides or Camera and Changing Box,			
Fight Wooden Unined Stand	0 15 0	0 17 6	0 17 6
Light Wooden Tripod Stand Aluminium Folding Stand	1 5 0	1 5 0	1 5 0
"PANROS" CAMERA in polished Teak, with Russia Leather Bellows and Brass-			
bound for Tropical Climates , as above	4 0 0	4 10 0	4 15 0
Additional Double Dark Slides in Teak.	7 0 0	7 .0 0	7.5
each	0 15 0	0 19 0	0 19 0

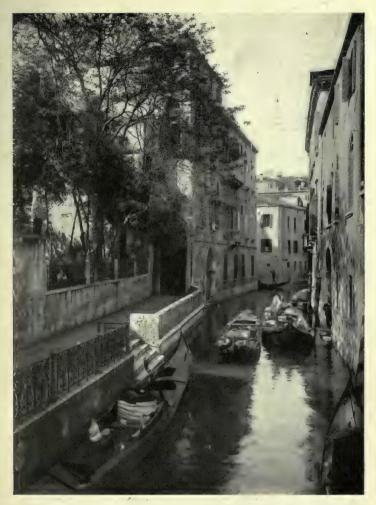
^{*} The Series II. "Homocentric" lens on P.C. Camera has a focus of 7 inches.

Cameras without Lenses are charged 25/- extra.

The Dark Slides supplied with the "Panros" Camera are of ebonized wood, solid form. The shutter of hard vulcanite can be wholly withdrawn. Either dry plates or cut films may be used. In most solid dark slides the spring securing the plate is in the head of the helder, and not infrequently it occurs that to remove the plate in the dark room is a troublesome task; but with the Ross' "Panros" dark slides the securing spring is placed in the lower end of the holder and a finger space is cut in head-piece which allows loading and unloading to be done with the greatest facility. Another feature in the construction of this dark slide is the means adapted to avoid the possibility of light leakage even should the shutter be carelessly withdrawn or replaced.

The light traps in slides are almost invariably defective, and the special arrangement in the Ross' "Panros" slide is therefore greatly appreciated, as it

entirely does away with this source of annoyance.



TAKEN WITH

Negative by FRANCIS BACON

ROSS' "HOMOCENTRIC" LENS."

6 in., Series III., f. 6'3

ROSS' PHOTOGRAPHIC LENSES & CAMERAS.

See preceding and following Pages, 35 to 66.



TAKEN WITH

[Copyright.

ROSS' "HOMOCENTRIC" LENS.

5 in., Series III., f. 6.3. Negative by J. C. CARTER.

Ross Limited, MANUFACTURING OPTICIANS,

111, NEW BOND STREET, LONDON, W. 31, COCKSPUR STREET, CHARING CROSS, S.W. Optical Works: CLAPHAM COMMON, S.W.

Focal Plane REFLEX CAMERA.

LIGHT, PORTABLE AND EFFICIENT.

This New Reflex Camera is compactly and strongly made in mahogany, and covered in morocco leather. All movements and adjustments are effected from the outside. The focussing-hood is moved into position by simply raising the lid secured by a catch at top; and the front (which is particularly steady) is moved forward, carrying the lens, by means of a milled-head on right hand side. The back revolves for taking pictures either way of the plate, and a rising front is provided. From its peculiar mechanism, the mirror allows of the lens-

board being racked further back than usual, so that short focus lenses may be used. The mirror itself is surface-silvered, to afford best definition. Another special

Feature is that the tension spring of the shutter has been done away with, the alteration of speed depending entirely

upon the width of slit, and the duration of exposure is directly indicated on the dial on left hand, thus obviating all calculation. To increase or decrease the slit, pull the upper knob slightly, and turn either way as required. See that the notch on setting

head (lower down) is brought opposite the white line while regulating the slit, and that the upper knob is quite home while setting the shutter. To effect this, turn the milled head until the blinds are fully wound, and then set the mirror by drawing the pin under the carrying handle down to the end of the slot. The release of both mirror and shutter requires but the sliding of the pin nearer the front towards the thumb rest behind it. A swing Front of special construction can be supplied with this Camera. The vertical swing is obtained by slipping off the rack at one side, allowing the front to advance, while the horizontal is effected by simply releasing clamp screws. A very useful addition is the Stereo Magnifer, which attaches to the Hood and is of great assistance in focussing. It also helps to keep the Hood well open.

	¼-plate 5½ in. Lens.		5½ × 3½ with Stereo attachment and 2 Lenses.	5 × 4 6 in. Lens.	½-plate 8½ in. Lens.
Price, with 3 Double Slides and Ross "Homocen- tric" Lens, 1/6.3 Code Words Ditto, with "Homocen-	£ s. d. 16 5 0 Reflap	£ s. d. 17 0 0 Reflate		£ s. d. 22 10 0 Refloor	£ s. d. 31 10 0 Refloat
tric" Lens, f/5.6 Code Words Do. with Ross - Zeiss	17 10 0 Reflin 5½ in. Lens.	18 10 0 Refliss	25 8 0 Refters 4½ in. Lens.	24 0 0 Reflitor	33 0 0 Reflorite 8½ in. Lens.
"Tessar" f/6·3 Code Words Solid Double Backs, each Code Word	16 15 0 Reflaz 0 7 0 Reboc	17 10 0 Refleztor 0 10 0		23 0 0 Reflizote 0 10 0	Reflotiz
Book Form Backs, each Code Word Extra for Swing Front,	0 15 0 Reboom	0 18 0	0 18 0	0 18 0	1 2 0
as above described Changing Box with 12 Sheaths	1 15 0 0 15 0	2 0 0 0 18 0	2 0 0 0 18 0	2 0 0 0 18 0	
Antinous Release, specially fitted	0 7 6	-	-	-	-

. THE 31 × 21 NEW . .

Focal Plane REFLEX CAMERA.

FOR DARK SLIDES, CHANGING BOX, OR FILM PACK ADAPTER.



Size, 5 x 5 x 5 inches. Weight, 21 pounds.

This extremely small new size Reflex Camera is made of mahogany, ebonised, covered with moroccoleather, the fittings being in black enamel.

Bellows are of leather, extending 8 inches.
Movements and adjustments are effected from the
outside, as in the lorger size model, all the advantages of which it possesses.

Focusing hood on top has a magnifier fitted, and together with the mirror screen, slides off to permit of cleaning.

Bick focussing screen is also hooded, and the camera can be used without the mirror movement if desired.

This small Camera is readily turned for oblong or upright pictures, a reversing back being unnecessary in this size. The mechanism works equally well either way.

There are bushes for attachment to tripod-stand in either position.

It has rising and cross-front movements.

Provided with Ross' "Homocentric" or Ross-Zeiss' "Tessar" Lens, the pictures obtained are of such excellent quality that they are suitable for considerable enlargement.

For every circumstance where portability is desirable this Camera is therefore the most useful form. A carrying handle is attached,

To set up the Camera, pull tab on lett, raising one side of the hood, and then the inner tab on right, which will bring both hood and magnifier into position.

The front milled head sets the mirror, and the back one the shutter.

The trigger releases both shutter and mirror simultaneously.

To increase or decrease the shutter slit, after bringing the pointer vertical, draw out the milled knob slightly, and turn either way as required. The disc marked 0 to 5 indicates the opening, and the plate below gives value of each in fractions of a second.



Best materials and workmanship ensure the Camera standing well in any climate.

PRICES OF 31 × 21 REFLEX CAMERAS.

PRICES OF	32	× 22	REF	LEX	CA	WEN	A3.		
Camera as described with a centric" lens, f/6-3 Ditto, with Ross" Hom	fo. 5 in			. Co	ode wor	d-Mini	flap 1	1 0	0
Ditto, with Ross-Zeiss Ditto,	'Tessa	r" Ler	18, 1/6.3	, fo. 41	in. "	-Mini	flaz 1	1 10	0
Solid form Double Backs						е	acu (7	U
Book form ,, Changing Box for 12 plates Film Pack Adapter							(15	
Solid Leather Sling Case changing box							(15	
Light Wooden Tripod Stan Aluminium Folding Stand,	extra l	ight							0
Antinuous Release Fitted	0.0							7	0

Focal Plane REFLEX CAMERA.

NEW TROPICAL MODEL.

Made of Polished Teak specially selected, with fittings of lacquered brass, and the body brass bound. The bellows are of Russia leather to withstand the attack of insects. Supplied with Skyshade, Shoulder Strap and special rack rising front and hinged hood.

In general construction the Tropical Model is similar to Regular Model, of which it has all the movements and advantages.

The dark slides, changing boxes and film pack adapters for use with the Tropical Model are all specially made of Teak.



The prices given below are for Tropical Models for the same size pla'es as the Regular Model, each being furnished with three double dark slides and Ross' lenses.

	-plate 5½in. Lens	Post Card Size, non- reversing 6 in. Lens	5 × 4 6 in. Lens	½-plate 8½ in, Lens
Price with J Double Slides and Ross "Homocentric" Lens f6'3	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Lens f5.6	23 7 0 Troflin 5½ in. Lens 22 1! 0	24 10 0 Trofliss 23 10 0	33 10 0 Troflitor 32 10 0	44 10 0 Trofiorite 8½ in. Lens 44 10 0
Solid Double Backs, each Code Word— Troboc. Book Form Backs, each Code Word— Troboom.	Troflaz 0 9 6 0 18 0	Trofleztor 0 14 0 1 2 0	Troflizote 0 14 0 1 2 0	Troflotiz 1 1 0 1 10 0
Film Pack Adapters ,, Changing Boxes ,,	1 1 0 2 12 6	1 5 0 3 0 0	1 5 0 3 0 0	2 0 0 3 15 0

ROSS' NEW MODEL TWIN-LENS REFLEX CAMERAS



THE absolute accuracy of the system of using a second lens for focussing and watching the object photographed, of the same construction and focus as the working lens, has induced Ross, Ltd., to design a Camera on this principle of quite novel arrangement.

The great advantage of the twin-lens over other Reflex Cameras is that the second lens not only serves for focussing and directing the Camera towards any object or particular part of the object, but there is no obliteration of the image after focussing.

It remains visible on the Screen during the exposure.

Ross' Twin-Lens Camera was originally made with a door closing over the front; afterwards with two folding doors and with considerable reduction in size.

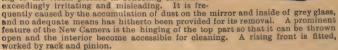
The New Model retains the two doors, and is still smaller and less in weight, with many serviceable additions, the idea being to introduce a camera embodying every possible convenience for easy manipulation, to be absolutely reliable in use, and compact and portable when closed up.

The working lens is furnished with the new "Koilos" diaphragmatic shutter working at from 1 to 350th second, more generally useful than the focal-plane, which is principally for high-speed work. Nevertheless the New Camera may be furnished with a focal-plane shutter if desired; the "Automat," "Centex" or other suitable

between-lens shutter substituted at the difference in Catalogue prices.

A conveniently shaped Automatic Hood is provided, enabling the operator to work in the strongest light.

Want of rigidity in the lens-carrying part of cameras is often a source of trouble, but in the New Model the arrangement of front is such that it is absolutely rigid in any position. Dim lighting of the visual picture in reflecting cameras is



The reflector is surface-silvered to give the full sharpness to the image projected by the lens.

ROS

NEW MODEL TWIN-LENS REFLEX CAMERA.



O set up the Camera for work open the lid at top, and the folding leather hood will be drawn up to its full extent, a strut providing support for the lid. Apply pressure to the fas-tening under front edge of the folding doors and turn the pinion head at right hand towards left, when the front carrying the lenses will move forward and the picture may be focussed on the screen.

When closing the hood, press down the spring before lowering the lid. The camera is suspended from the neck by a sling or mounted upon a stand, suitable bushes being provided for the purpose. This Camera may not only be made with focal plane shutter if desired, but also with revolving back and square finder portion, so that objects may be viewed and pictures taken either way of the plate.

DIMENSIONS of 1-plate Camera - 71 inches long, 53 inches deep by 47 inches wideclosed.

Weight, fitted with pair 5-inch "Homocentric" Lenses f6:3 and new "Koilos" Shutter 34lbs anuroximately

Prices-Including 3 Double Dark Slides with 4-plate	5 × 4 ½-plate
"Homocentric" Lens f6.3 and "Koilos" 5in. lens	es 6in. lenses 7in. lenses
Shutter £15 17	6 £18 12 6 £22 10 0
Code Words Twapok	Twerok Twigok
Ditto ditto and "Automat" Shutter 15 10	
Code Words Twapani	
With "Homocentric" Lens 5.6& "Koilos" Shutter 18 2	
Code Words Twinok	
Ditto ditto and "Automat" Shutter 17 10	
Code Words Twinant	Twomant Twutant
Either of the above with Square Finder and	
Revolving Back-add "ir" to Code Word & 1 10	0 1150 200
Time & Instantaneous Focal Plane Shutter &	
Constructing Camera to take same—add	
"os" to Code Word and 4 0	0 450 500
Focal Plane Shutter and Revolving Back com-	
bined—add "ut" to Code Word and 5 10	
Note If Diaphragmatic Front Shutter is not require	d add "zo" to altered Code

Word, and List Price of the Snutter will be deducted. Twin-lens Cameras sold without lenses will be charged 22 extra.

EXTRA DOUBLE DARK SLIDES. $-4\frac{1}{4} \times 3\frac{1}{4}$, 15/-; 5 × 4, 18/-; 61 × 43, £1 2/-; 81 × 61, £1 5/-

BAG CHANGING BOXES with ROLLER SHUTTER (12 plate Sheaths).—4½ × 3½, £2; 5 × 4, £2 5/-; 61 × 42, £2 15/-.

EXTRAS.

Extra for Camera in Polished Mahogany with 3 Dark Slides, fully brass bound, $4\frac{1}{4} \times 3\frac{1}{4}$, 50/-; 5×4 , 55/-; $6\frac{1}{6}$ by $4\frac{3}{4}$, 60/-.

Double Swing Back Attachment, polished black, $4\frac{1}{2} \times 3\frac{1}{2}$, 25/-; 5×4 , 30/-; $6\frac{1}{2} \times 4\frac{3}{4}$; 35/-; $7\frac{1}{2} \times 5$,

Steel Plate or Film Sheaths, for Changing Box, per doz., $4\frac{1}{4} \times 3\frac{1}{4}$, 5/-; 5×4 , 6/6; $6\frac{1}{4} \times 4\frac{3}{4}$, 7/6.



Roll Film and Plate Camera

COMBINED.



HIS Camera is made for 4½ by 5½ or for Postcard size, 5½ by 5½, and by special arrangement of Sliding Door at back admits of Plates being used as we las Roll Films.

It takes the ordinary Commercial Spools of Films or Plates as desired, the Carriers requiring no special adaptation.

It is of Metal, leather covered, of the finest workmanship and finish, and has every desirable movement.

Efficiency, Convenience, Lightness, Portability.

Prices-

For pictures 4½ by 3½ on Roll Films or Plates, with Pull-out ordinary Extension, Rising Front, 3 Metal Slides, new B. & L. "Automat" Shutter, the "Centex," and Ross' "Homocentric" Lens Series III. f6.3.

Or with "Koilos" Shutter, 14s. extra.

For pictures 4½ by 3½ on Roll Films or Plates, with Rack and Pinion Double Extension, Racked Rising Front, Screw Cross Motion, 3 metal slides, new B. & L. "Automat" Shutter, the "Centex," and Ross' "Homocentric" Lens Series III. f6.3.

Complete as described £10 0 0

Or with "Koilos" Shutter, 14s. extra.

Extra Plate Holders, metal, each, 1s. 6d.

For pictures 5½ by 3½ (Post Card size) on Roll Films or Plates, with Double Extension, Quick and Fine Adjustments for Focussing, Rising and Falling Front actuated by Rotating Rack, Screw Cross Motion, new B. & L. "Automat" Shutter, the "Centex," and Ross' "Homocentric" Lens Series III. f6:3.

Complete as described, with 6 Metal Piate Holders.. £11 5 0

Or with "Koilos" Shutter, 14s. extra. Extra Single Metal Plate Holders, each, 1/9.

Each Camera is provided with Gircular Level, Brilliant Pattern Finder, B. & L. new "Automat" Shutter, the "Centex," and the Ross' "Homocentric" Series III. f 6'3,

KODAK CAMERAS

Supplied fitted with Ross or Ross-Zeiss LENSES. - - -

No. 3 FOLDING POCKET KODAK, with Ross 5-inch "Homocentric" Lens f/6-3 and "Automat" Shutter for pictures 4½×3½. Code Word, Kapaut .. &8 5 0



Lens //6'3 instead of "Homocentric." Code Word, Kerez ... £10 2 & Ten-Exposure Spool of Kodak N.C. Film. Code Word, Filbe 3/0

Six-Exposure Spool of Transparent Film.
Code Word, Filbers 1/9

No. 4a FOLDING KODAK embodies all the features of the popular No. 3a Folding Pocket Kodak; gives large direct Picture 64 × 44 on roll-films or plates; with Ross "Homocentric" Lens 1/8. Code Word, Kifaut.

£13 7 0

The PANORAM KODAK, fitted with "Homocentric" Lens, Series IV., f/6.8, in special setting and four diaphragms, in pull-off case.

No. 4.—For Pictures $12 \times 3\frac{1}{2}$ inch, capacity four exposures without relading. Size of Camera, $10 \times 5\frac{1}{2} \times 4\frac{3}{2}$, weight 21bs. 10 ozs. Code Word, Pako.



The "Homocentric" Lenses can be adapted to customers own Kodaks, etc.

ROSS, LTD., offer to Amateur and Professional Photographers and Process
Workers a greater choice and a finer selection of high-class lenses than any other
manufacturer in the world.

THE ABOVE PRICES ARE NET.

ROSS, Limited, 111, New Bond Street, London, W., and 31, Cockspur Street, Charing Cross, S.W.

Wholesale Department and Optical Works-CLAPHAM COMMON, S.W.

Indicator and Calculator

TIME & INSTANTANEOUS —PATENT SHUTTERS—

THORNTON-PICKARD'S STANDARD PATTERN

To fit on either the Hood or Tube of Lens. Particulars of the smallest size.

Price 14/6

Speed up to an of a second. Dimensions, $3\frac{1}{4} \times 3 \times \frac{7}{8}$ inches. Weight, $3\frac{3}{4}$ ozs.

SPEED INDICATOR INCLUDED.

Size, to fit on a Lens Hood or Tube up to ins. diam.—	13	15	2	21/2	3	31/2
TIME AND INSTANTANEOUS STANDARD Do. do. BEHIND LENS	14/6 15/6 12/6 13/6	15/- 16/- 13/6 14/6	16/- 17/6 15/6 16/6	18/- 19/6 18/- 19/-	21/- 22/6 	25/- 26/6
"ROYAL" PATTERN BEFORE LENS PATTERN, latest BEHIND ,, ,, ,,	19/- 20/-	19/6 20/6	20/- 21/6	23/6 25/-	26/6 28/-	=
EXTRA RAPID AND FOREGROUND TIME AND INSTANTANEOUS	_	23/6	25/6	28/6	32/6	37/6
STEREOSCOPIC Time and Instantaneous, at 3 in. or Do. do. Behind Lens do. j. in. centres, 21- extra; 3\frac{2}{2}\times.centres, 41- extra Adjustable Panel for Behind Lens, extra 7/6	20/- 22/6	21/-23/6	23/- 25/6	27/- 29/6	=	=
SNAP SHOT, for Instantaneous only. STANDARD PATTERN	10/-	10/-	12/-	15/-	20/6	-
ALUMINIUM do. SPECIAL. for more rapid Instantaneous	9/-	9/-	10/6 25/6	13,6	32 6	37/6
SILENT STUDIO		23/0	20/6	23/6	27/6	32/6

Between - Lens Shutters.

The "KOILOS" Improved Diaphragmatic Sector Shutter with Air Brake.

Suitable	for "	HOMOCENT	RIC" ar	nd Ross	-Zeiss	"TES	SSAR" L	enses.
5-in, and 6-in	1. f8; 5	6-in. f6.3.			Price	35/0 C	Code Word	Koilos.
7-in. $f8$; $5\frac{1}{2}$ -i 8\frac{1}{2}-in. $f8$; 7-i	n. and	8-in. f6.8;	5½-in., 6-	in. and	11	40/0	11	Koilata.
7-in. f5	6		· · · ·		29	48/0	21	Koilion.
10-in. and 12	-in. J8	; 10-1n. 76'3;	85-1n. J 5	0,9	99	60/0	91	Koilina.

The "COMPOUND" Shutter with Iris Diaphragm and Distinct Automatic & Spring Actions.

Suitable for "HOMOCENTRIC" and Ross-Zeiss "TESSAR" Lenses. *No.

0.0-5 and 6-in. f8; 5-in. f6.8; 5-in. f6.3	Price	35/0	Code Word	Companil
1—7-in. f8; 6-in. f6.8; 6-in. f6.3;				-
5 and 5½-in. f5.6	22	40/0	22	Compear
1A-7-in. f6.8	91	42/0	11	Compexil
$2-8\frac{1}{2}$ -in. $f8$; 7-in. $f6\cdot3$; 6-in. $f5\cdot6$	99	48/0	31	Complet
2A-10-in. f8; 8½-in. f6.8; 8½-in. f6.3;				
7-in. f5.6	11	54/0		Compos
3—12-in. f8; 10-in. f6.8; 10-in. f6.3;	"		• • • • • • • • • • • • • • • • • • • •	
8½-in. f 5·6	22	60/0	,,	Comptum
4—12-in. f6.8; 12-in. f6.3; 10-in. f5.6	**	65/0	11	Comptura
* No. 0 has the "Antinous" Rele				
Cost of fitting to Customers' or	wn Lens	ses, 7/	eacn.	

B. & L. New Pattern Automatic Shutter, The "CENTEX."

Taking the place of the small size "AUTOMAT."

Compact, light tight and Dust-proof. All valves in Interior. Fitted with Ball or with "Antinous" Release.

Everset and provided with Locking Lever.

From 1 to 120 Second, also Time and Bulb Exposures.

In Aluminium Case Ball and Tube or "Antinous" Release, extra. Code Word Centex

The "AUTOMAT"

For Lenses with opening of 30 mm. Code Word Autura 40 mm. To Lenses of other Manufacture, 52/6, 67/6, according to size.

"VOLUTE" Iris Diaphragmatic Shutter (B.&L.)

				لننف			7					(
For Lenses	with	opening	of 24	mm			£2	12	0		Code W	ord Volu
33	99	25	36	mm.			3	17	6		13	
33	99	22	52	mm.	,		4	4	0		39	Volutar
		Th	o Di	icee	ana	fon	Shu	1++0	ne	only		

I.R. Pneumatic Release, 1/- extra. "Antinous" Release, 2/6 extra,

ROSS, Ltd., Manufacturing Opticians, LONDON.

OSS' "CENTURY" CAMERA.

An instrument of the highest quality and finish, in which the advantages of the "Square" and "Tourist" Pattern Cameras are combined.





This Camera has been specially designed to meet the requirements of the modern Anastigmatic Lenses.

The chief advantages of the "Century" Camera are :-

lst.-Its Lightness and Portability. 2nd.-Its Extensive Rising Front. 3rd.-Its Double Rack Focussing.

DESCRIPTION.

Expert users of modern high-class Lenses have hitherto found that the oldfashioned square bellows cameras, notwithstanding their weight, possessed some fashioned square believes cameras, notwithstanding their weight, possessed some points of advantage over the lighter and more popular tourist patterns. The defects of the usual conical bellows cameras are especially noticeable when photographing architectural subjects with wide-angle lenses, or copying. In the former case the bellows is forced backwards in front of the plate when the lens is raised, and unless great care is taken a portion of the picture is lost. When copying it is a great advantage to have the lens fixed and to focus from the back, but with most portable cameras the contrary is the case.

The "Century" Camera has been introduced because it is entirely free from

the defects enumerated above, and combines, in a most perfect manner, the

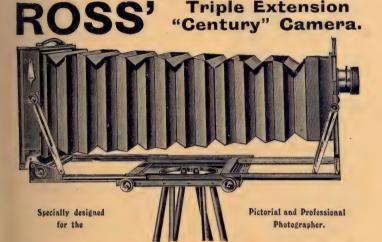
advantages of both systems.

PRICES.

The following prices include camera, three double dark slides, best quality threefold tripod and revolving turntable, complete

Total or Post and Total 1119 carried to or French												
Size in inches.	Prices.		Code Word.		Extra Do		Brass Bind- ing extra.	Size of Camera closed.				
61× 42	£11 10	0	Centasa		£1 2	0	£1 10 0	8½ × 8½ × 2				
7½× 5	12 10	0	Centem		1 2	0	1 10 0	9½× 9½×2				
85× 61	14 0	0	Centipo		1 5	0	1 15 0	11 × 10½ × 2½				
10 × 8	16 0	0	Centor		1 12	0	2 0 0	12½×12½×3				
12 ×10	19 0	0	Centus		2 0	0	2 10 0	14½×14½×3				
15 ×12	24 0	0	Centale		2 15	0	3 0 0	173×173×33				
18 ×16	35 0	0	Centup		3 10	0	4 0 0	21 ×21 ×31				

For 12×10 and larger sizes we recommend a light supplementary leg for the front of camera. The price of this, including camera fittings, is 10/6.



It has every movement requisite, and the extensions, back and front, render the adjustment for size of copy in reproduction particularly easy and convenient.

This Camera has all the advantages of the square bellows camera without its bulk, weight, and other drawbacks. Amongst its many good points are the following, viz.:—

1st.-Its Extreme Lightness and Portability.

2nd.—The Triple extension of bellows, enabling Lenses of long focus to be used, such as the single combinations of the Ross-Zeiss Convertible "Protar" and other Lenses. The Half-plate Camera has an extension of fully 22 inches.

3rd.—Its Extensive Rising and Swing Front.

4th.—Its adaptability for short focus or wide angle work.

5th.—Its Strength and Rigidity when in use.

6th.—Its Simplicity of working parts and its First-class Workmanship and High Finish.

PRICES.

The following prices include camera, three double dark slides, best quality three-fold tripod and revolving turntable, complete.

Size in					Extr	a Do	uble	Brass Bi	nd-	Size of Camera
Inches	P	rices		Code Word.	Darl	k Sli	des	ing exti	:8.	Closed, about
$6\frac{1}{4} \times 4\frac{3}{4}$	£14	0	0	Dastric	£1	2	0	£1 10	0	$9\frac{1}{4} \times 9\frac{1}{4} \times 2\frac{1}{4}$
$8\frac{1}{2} \times 6\frac{1}{2}$	17	10	0	Deutric	1	5	0	1 15		$11\frac{1}{4} \times 11\frac{1}{4} \times 2\frac{3}{4}$
10×8	22	0	0	Diotric	1	12	0	2 0	0	$13 \times 13 \times 3\frac{1}{4}$
12×10	26	0	0	Duptric	2	0	0	2 10	0	$15\frac{1}{4} \times 15\frac{1}{2} \times 3\frac{3}{4}$

With the exception of extra extension, the remarks referring to the advantages of this Camera are equally applicable to the Double Extension "Century" Camera.

Improved Portable Square Bellows Cameras.

DOUBLE EXTENSION WITH REVERSIBLE HOLDERS.

For Lenses of Long Focus. The $7\frac{1}{2} \times 5$ size extends from 3 to $17\frac{1}{2}$ in.



THIS pattern is a favourite with Professional Photographers and Process Workers, and also for Railway, Shipyard, and Engineering Photographic Work.

The Front is rigid, and therefore well adapted for carrying long focus heavy lenses, and, as the bellows racks backwards, wide-angle lenses may be employed without having the foreground of the picture cut off by the baseboard, as frequently happens with Cameras of other patterns. The baseboard folds over the ground-glass screen when closed, thus protecting it from danger of breakage.

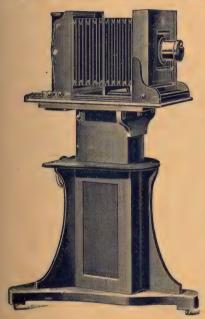
Double Brass Bind-Rack and Price of Brass Dark ing Dark Pinion to Size. binding Camera Slides. Slides. double only. extra. Each. Each. Swing Back Squall .. £0 15 2 Squamose 0 15 7 Squander 0 15 5 0 10 81× 61 ... 15 5 Squash Squib 12 ×10 0 10 15 ×12 0 Squint .. 13 10 15 2 10 3 10 Squire 0

The prices of Cameras include two fronts or lens boards.

ROSS, Ltd., Manufacturing Opticians, LONDON.

Code word for sets consisting Camera with rack and pini adjustment to swing back a with three double dark slide

New CAMERA and STAND for the STUDIO



Ross, Limited, have constructed a greatly improved form of Studio Camera for 12 × 10 Plates and upwards.

This new construction is original in itself, and embraces all recent useful additions, affording the operator facilities that have been hitherto unattainable.

Ross' Improved Studio Camera hand has newly designed Rack and Pinion work. The application of front and rear pinions is on a novel system, producing a particularly even and sweet motion. There is Rack and Pinion to the swing, and the Roller Slide takes the plate either way. A Repeating Back for two pictures on one plate is supplied.

The Special Stand is quite novel in design, and, being very elegant and substantial, forms, in combination with the Camera, a most attractive studio apparatus.

The top of the Stand, on unusually substantial column, is raised or lowered by the action of the handwheel at the back, and the titting of the table is effected by Rack and Pinion.

Price of Improved Studio Camera with Stand as

	Size	9					Ĭ						
12	X	12	for	plates	12	×	10	and under	 • •	 £29	5	0	
15	×	15		,,	15	×	12	,,	 	 32	10	0	
20	×	20			20	×	18	11	 	 43	0	0	

CAMERAS AND OUTFITS

for Line Reproduction, Photo Copying, Enlarging for Collotype, Photogravure, and Photo-Lithography; for Half-tone, Photo Engraving in Monochrome or Three Colours, and for all Process Work.

SPECIAL RULED SCREENS, PRISMS, MIRRORS, FILTER CELLS, &c.



THE general features and advantages of the form hitherto so much appreciated have been maintained; but by a modification of the body of the Luntern it is own suitable for illuminants of all descriptions without special adaptation for the "Nernst "Lamp, Lime Light, Oil Lamp, Spirit Incandescent, and the "Nelson" Arc Lamp as at foot. The expense of the supplementary aluminium and brass body need only be incurred when it is desired to use a larger form of arc lamp than that indicated.

No.		eter of enser.	Negative f	ully covered.	PRICES without Objective, but including good	Code Word.
	Inches.	m/m	Inches.	c/m	Oil Lamp.	
0 1 2 3 4 5	5½ 6½ 7 8 9 10	140 163 177 203 228 253 270	4½ × 3½ 5 × 4 5½ × 4½ 6½ × 4½ 7 × 5 8 × 5 8½ × 6½	9 × 12 12 × 16 13 × 18	£10 0 0 12 0 0 13 10 0 15 0 0 20 10 0 25 10 0 32 0 0	Enactor. Enchanter. Endower. Engrosser. Enfilade. Enigma. Enroller.

NOTE,—Arc Lamps or small illuminants require the size larger Condenser than those listed.

EXTRA.

						T	ATRA	4.0
Fine focussing and Locking D						. £	1 10	0
Ditto with extra Bellows Exte	ension						1 15	0
Incandescent Fittings instead							0 12	6
Brass and Aluminium Bodyin	place of Rus	ssian Iron	for Ross	'Arc La	ump .		3 15	0
Special Tray to fit this body to	o take any	Jet					0 8	0
Ross' Jet with cut-off for Lim-	elight Body	7					2 12	6
Ordinary Jets, from				£1	5 0	to	2 15	0
"Radiant" Jet							4 4	0
The "Nelson" Arc Lamp, up	to 100 volts						1 10	0
Ditto, up to 200 volts						. :	2 2	0
"B" Are Lamp, requiring spe	ecial body						5 5	0
The "Alcool" Spirit Incandes	cent Lamp.	burnsor	dinary m	ethylat	ted spiri	it :	2 2	0
"NERNST" LAMPS.	Pric		xtra Bu					e.
	£ s.	d.	8. 0	1.	8.	d.		
No. 1, 35 to 60 c.p.	0 18	0	2	0	1	3		

No. 1, 35 to 60 c.p.		0 18		2 0	1	
No. 2, 300 to 500 c.p.		1 10		5 0	2	
No. 3, 500 to 1000 c.p.	• •	2 5	0	10 0	2	6

ROSS Binocular Glasses

SPECIALLY LIGHT MODEL.



Magnification 5 times.

The mounts are composite, Brass. German Silver and Aluminium, a construction possessing the double advantages of strength and light weight.

A special feature of this Glass is its newly computedOptical System whereby increased brilliancy and definition have been attained.

Prices in Solid Leather Sling Case.

****** * * * * *	011 101 01 01			
With I'S inch	Object Glasses, 21 Lignes	£Z	7	e.
		de ti		U
With 2 inch (bject Glasses, 24 Lignes		47	
AA TOTT TO LITTER O	Diece Chasses, 27 Lighes	 a	17	ь

The Ross "Field" Jointed Glass. 12 Lenses of Superior Quality.



The Special Features of the Ross "Field" Glass are the convenient jointing of the bars, its strength and light weight, secured by the composite nature of the mounts and the increased Brilliancy and Definition afforded by the newly computed Optical System.

Glasses with Centres wider or narrower than the separation of the user's eyes strain the sight and produce fatigue; but the exact coincidence of the two fields obtained when using the Universal Field Binocular avoids this, ensures perfect vision and produces as a natural result a sense of comfort that is otherwise unattainable.

Prices in Solid Leather Sling Case.

		_
Free Aperture of Object Glasses, 1-55 inch	£3 7	6
1.Q inch	7 40	0
)))))) 10 IHCH	3 10	U
2 inch	4 0	0

FOR EVERY PURPOSE for which a High-Power Field-Glass is indispensable.

ROSS' Celebrated PRISM BINOCULARS





TMDD	OVED	MODE	ET.

NEW STEREO-PRISMATIC.
Magni- With Screw Focussing feating Focusing Adjustm

Magni		With				ssing by		Magni-		With Sc			ocus		
fication	1	Foc	ussi	ng	Adju	istment		fication		Focuss			Adju		
Times.		Adju	stm	ent.	of Ey	epieces.		Times.		Adjustm	ent.	C	of Ey		ces.
6		£6	5	0	 £5	5 0		. 6					*£7	10	0
8		6	10	0	 5	10 0		. 8		7 10	0		6	10	0
10		7	10	0	 6	10 0		. 10		8 10	0		7	10	0
12		8	10	0	 7	10 0		. 12		-			*9	0	0
					* 8	pecially	v for	Marine	use.						

Sole Sale Agents for Ross' Lenses & Cameras.

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ROSS, Ltd., MANUFACTURING OPTICIANS,

Wholesale Department and Optical Works—Clapham Common, S.W.
Contractors to His Majesty's Governments, British and Colonial.

Also to the principal Foreign Governments.

Everything

from the development of the negative to the framing of the mounted enlargement



RAINES & CO.

:: :: THE STUDIOS :: :: EALING, LONDON, W.



Bromide Enlargements,

BLACK & WHITE AND SEPIA.

ON PAPER (Single Copies).

ORDINARY (Rough or Smooth). PLATINO MATTE (Rough or Smooth)
GLOSSY (White or Pink). CREAM CRAYON.
EXTRA ROUGH (White or Cream).

SIZE.	Black & White Enlargement Unmounted	Sepia Enlargement Unmounted	Rough Mounting Extra	Mour on F Su Mou Ex: 2nd Q'lty	late nk ints,	Cut Out Mounts, 6 Sheet	Cut Out Mounts, 12 Sheet	Finish and Mor 3rd Class	White nochro Extra 2nd Class	or	Water Col	hing in or Oil ours
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	-/9 1/3 1/6 1/9 2/6 2/6 3/3 3/6 4/0 5/6 8/6 8/6 10/0 13/6 15/0 20/0 25/0 30/0	34/0 34/0	-/1 -/2 -/3 -/4 -/6 -/9 -/9 1/0 1/6 1/6 2/0 3/6 4/0 15/0 15/0	1		8/0	18/0	30/0 Stretch	12/0 12/0 18/6 18/6 18/6 30/0 45/0	30/0 40/0	7/6 10/6 12/0 13/0 17/0 25/0 30/0 32/0 36/0 42/0 42/0 42/0 60/0 80/0	15/0 19/6 22/0 22/0 31/6 31/6 31/6 50/0 63/0 63/0 67/0 67/0 75/0 80/0

PANORAM SIZES.

-						
12 X 4	1/2/1/	2 -12	_/11	1 -12 1/4	20 50	10/0 12/0 21/0 15/0 17/0 31/6 24/0 36/0 63/0
A4 / -}	110 11	0 3	1 1 4 4	10 1/4	2000	10/0 12/0 21/0
18 × 6	2/6 3/	1 -16	- 1/6	1 1/3 2/6	1/0/0/0	15/0 17/0 21/6
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20 4 03	5 C 7	4 1 0	- 2/0	2/0 7/0	6/0/12/0	24/0 26/0 62/0
. 30 ^ 91	3/0 //	* I/U	3/0	1 3/0 1/0	0/0/12/0	24/0 30/0 03/0

[†] Best Plate Paper Mounts, Plate-Sunk, with paste down India Tint.

The above prices are for enlargements from negatives. If photographs are sent an extra charge of 1/0 is made for the negative.

It should be taken into consideration that Enlargements from Copies or Positives require extra finish the work done being in proportion to the amount paid.

The Finishing on Groups of two figures is charged at one-third extra, and of over two at special rates, but if finished at above prices, the work is distributed over the several figures.

We shall be pleased to supply Forms for Ordering Enlargements, which will be found to greatly facilitate the despatch of orders, and obviate the chance of mistakes.

[‡] A cheaper Board, Plate-Sunk, with paste down India Tint, but not faced with Plate Paper.

Oval Bromide Enlargements.

BLACK & WHITE AND SEPIA.

Mounted on Best Plate Paper Mounts, with Oval Plate Mark and India Tint.

SIZE	Number of Copies from same Negative	Black and White Enl'gts. Mounted on Oval Tint, Plate- mark Mount, Each	Sepia Enlarge- ments Mounted on Oval Tint, Plate- mark Mount, Each	White,	or Mono tra, Eac 2nd Class	chrome	Water	ning in r or Oil , Extra ach
6½ × 4¾	I copy 3 copies 6 ,,	1/3 1/2 1/1 -/11	1/6 1/5 1/4 1/2	1/3 1/3 1/2 1/1	3/0 3/0 2/9 2/6	6/0 6/0 5/6 5/0	7/6 7/0 6/6 6/0	15/0 14/0 12/0 10/0
8½ × 6½	1 copy 3 copies 6 ,,	2/3 2/1 1/11 1/9	2/8 2/6 2/4 2/2	1/6 1/6 1/4 1/2	4/0 3/9 3/6 3/3	8/0 7/6 7/0 6/6	10/6 10/0 9/6 9/0	19/6 19/0 18/0 17/0
10 × 8	1 copy 3 copies	2/9 2/7 2/5 2/4	3/3 3/1 2/11 2/9	2/0 1/10 1/8 1/6	5/0 4/9 4/6 4/3	10/0 9/6 9/0 8/6	12/0 11/6 11/0 10/6	21/0 20/0 19/0 18/0
12 × 10	I copy 3 copies 6 ,,	3/0 2/10 2/8 2/6	3/6 3/4 3/2 3/0	3/0 2/10 2/8 2/6	6/0 5/9 5/6 5/3	12/0 11/6 11/0 10/6	13/0 12/6 12/0 11/6	22/0 21/0 20/0 19/0
15 × 12	I copy 3 copies 6 ,,	4/0 3/9 3/6 3/3	4/9 4/6 4/3 4/0	4/0 3/9 3/6 3/3	9/0 8/6 8/0 7/6	15/0 14/6 13/0 12/0	17/0 16/0 15/0 14/0	31/0 30/0 28/0 26/0
18 × 15	I copy 3 copies 6 ,, 12 ,,	6/6	7/6 7/3 7/0 6/9	5/0 4/9 4/6 4/3	10/0 9/6 9/0 8/0	20/0 19/0 17/0 15/0	25/0 24/0 23/0 22/0	40/0 38/0 36/0 34/0

BROMIDE ENLARGEMENTS on CANVAS

WARRANTED NOT TO CRACK OR PEEL OFF.

SIZE	irge-	Painting in Oil Colours Extra			SIZE	arge-	Painting in Oil Colours, Extra			
OILIS .	Enlarge	3rd Class	2nd Class	Ist Class	CIED	Enlarge	3rd Class	2nd Class	Ist Class	
12 × 10 14 × 12 18 × 14 21 × 14 20 × 16 21 × 17 24 × 18	5/6 7/0 8/0 9/6 11/0 12/0 14/0	15/0 16/0 18/0 20/0 30/0 35/0 40/0	30/0 35/0 40/0 45/0 50/0 55/0 60/0	50/0 55/0 60/0 70/0 80/0 85/0 90/0	24 × 20 30 × 25 36 × 28 44 × 34 48 × 36 50 × 40	15/6 20/0 25/0 35/0 45/0 55/0	40/0 45/0 50/0 60/0 80/0 100/0	60/0 65/0 80/0 90/0 110/0 150/0	90/0 100/0 120/0 130/0 160/0 200/0	

These Enlargements are produced on specially prepared Canvas, stretched on wedged frames,

RAINES & CO., EALING.

Circular Bromide Enlargements.

BLACK & WHITE AND SEPIA.

Mounted on Best Paper Plate Mounts, with Circular Plate Mark and India Tint.

SIZE	Number of copies from same	Black & White Enlarge- ments	Enlarge- ments	White,	ng in Bla or Mono etra, Eac	chrome	Finishing in Water or Oil Colours, Extra, Each		
	Negative	Mounted Each	Each	3rd Class	2nd Class	Ist Class	2nd Class	Ist Class	
6 in. diam.	I copy	1/9	2/2	1/3	3/0	6/0	7/6	15/0	
	3 copies	1/7	2/0	1/3	3/0	6/0	7/0	14/0	
	6 ,,	1/5	1/10	1/2	2/9	5/6	6/6	12/0	
8 in. diam.	I2 ,,	1/3	1/8	1/1	2/6	5/0	6/0	10/0	
	I copy	2/6	3/0	1/6	4/0	8/0	10/6	19/6	
	3 copies	2/4	2/10	1/6	3/9	7/6	10/0	19/0	
	6 ,,	2/2	2/8	1/4	3/6	7/0	9/6	18/0	
10 in. diam.	I2 ,,	2/0	2/6	1/2	3/3	6/6	9/0	17/0	
	I copy	3/0	3/8	2/0	5/0	10/0	12/0	21/0	
	3 copies	2/10	3/6	1/10	4/9	9/6	11/6	20/0	
	6 ,,	2/8	3/4	1/8	4/6	9/0	11/0	19/0	
12 in. diam.	I copy 3 copies 6 ,,	2/6 3/6 3/3 3/0	3/2 4/0 3/9 3/6	1/6 3/9 3/6 3/3	4/3 7/6 7/3 7/0	8/6 15/0 14/6 14/0	10/6 17/0 16/0 15/0	18/0 27/0 25/0 23/0	
15 in. diam.	I copy 3 copies 6 ,,	2/9 6/6 6/3 6/0	3/3 7/6 7/3 7/0	3/0 6/0 5/9 5/6	6/9 11/0 10/6 10/0	13/6 18/6 17/6 16/6	14/0 21/0 19/0 17/0	21/0 38/6 36/6 34/6	
18 in, diam.	12 ,,	5/9	6/9	5/3	9/6	15/6	15/0	32/6	
	1 copy	9/0	10/6	8/0	12/0	24/0	32/0	50/0	
	3 copies	8/9	10/3	7/6	11/6	23/6	30/0	48/0	
	6 ,,	8/6	10/0	7/0	11/0	23/0	28/0	46/0	
	12 ,,	8/3	9/0	6/6	10/6	22/6	26/0	44/0	

Bromide Contact Prints.

ORDINARY (Rough or Smooth). PLATINO MATTE (Rough or Smooth). GLOSSY (White or Pink). CREAM CRAYON. EXTRA ROUGH (White or Cream).

SIZE					Unmou ne nega		Prints, including Mounting on Photographer's Own Mounts and Spotting					
Un- trimmed	Trimmed	Single Copies	12	25	50	100	500	12	25	50	100	500
C.D.V. † plate Cabinet † plate 7½ × 2¾ 7 × 5 8½ × 6½ 9 × 7 10 × 8 12 × 10 15 × 12	3½ × 2¼ 4 × 3 5¼ × 4 6 × 4⅓ 7 × 2¼ 8 × 6 8½ × 6⅓ 9½ × 7¼ 11½ × 9⅓ 11½ × 11½	-/3 -/4 -/4 -/5 -/5 -/7 -/7 -/10 1/2 1/9	2/0 2/0 3/6 3/6 4/6 6/6 6/6 8/0 12/0 18/0	22/0	40/0	11/0 11/0 19/6 19/6 27/0 27/0 37/6 37/6 50/0 75/0 112/0	42/0 42/0 80/0 80/0 125/0 125/0 170/0 170/0 220/0 250/0 350/0		18/9 27/6	18/6 25/0 25/0 35/0	46/6 46/6 62/6	160/0 160/0 212/0 212/0 275/0 356/0

SEPIA TONING 333 per cent EXTRA.

RAINES & CO., EALING,

Platinotype Enlargements.

								_			
SIZE	Price Unmounted Extra Copies Unmounted RoughMounting		Mounting potting	Extra Extra counting on ia Tint with late Mark		Cut Out Mounts, 12 Sheet	Finish and \	ning in White,	Black Extra	Finishing in Water or Oil Colours Extra	
	Unm	Extra	Rough	Ind	India Tint Plate Mar and Spotti Cut Out Mounts, 6 Sheet		3rd Class	2nd Class	Ist Class	2nd Class	Ist Class
6½ × 4½ 8½ × 6½ 10 × 8	4/6 6/0 6/6	-/4 -/8 -/10	-/3 -/4 -/6	-/6 -/8 1/0	-/4 -/6 -/6	-/8 1/0 1/0	1/3 1/6 2/0	3/0 4/0 5/0	6/0 8/0 10/0	7/6 10/6 12/0	15/0 19/6 21/0
12 ×7½ 12 ×10 } 15 ×12	7/6 10/0 10/0	1/4 2/1 2/1	-/6 -/8	1/0 1/4 2/0	-/8 1/0 1/6	1/4 2/0 3/0	3/0 4/0 4/0		12/0 15/0 15/0	13/0 17/0 17/0	22/0 31/6 31/6
17 × 10½ 18 × 15 20 × 16 23 × 17	13/6 16/0 18/0	3/0 4/3 4/7	-/8 1/1 1/6 1/6	2/0 2/0 3/6	1/6 1/6 2/6	3 0 3 0 5 0	5/0	10/0 11/0	22 0 22 0 24 0	25/0 30/0 32/0	40/0 48/0 50/0
24 × 18 24 × 20 29 × 17½	18/6 21/0 35/0	5/0 5/0 12/0	1/6 1/6 1/8	3/6 3/9 4/9	2/6 2/6 3/6	5/0 5/0 7/0		12/0 12/0 18/6	24 0 24 0 30 0	36/0 36/0 42/0	63/0 63/0 67/0
30 ×22 30 ×25 36 ×28	35/0 37/0 42/0 50/0	12/0 14/0 19/0 24/0	1/8 2/3 5/0 6/0	4/9 5/9 12/6	3/6 7/6 8/0 9/0	7/0 15/0 16/0 18/0	9/6	18/6 18/6 30/0 45/0	30/0 30/0 40/0 60/0	42/0 47/0 60/0 80/0	67/0 75/0 80/0
40 × 30 48 × 36		34/0	9/6		-	18/0		65/0		110/0	135/0

Bromide Enlargements.

ON OPAL. (Single Copies).

	Black and White	Sepia Enlarge-	Finishing or Mor	in Black a		Finishing in Water Colours, extra		
	Enlarge- ments	ments	3rd Class	2n d Class	Ist Class	2nd Class	Ist Class	
6½ × 4¾ 8½ × 6½ 10 × 8 12 × 7½ or 12×10 15 × 12 17 × 10½ 18 × 15 20 × 16 24 × 18	1/9 2/0 3/0 3/6 5/6 6/6 12/6 15/0 20/0	2/4 2/8 4/0 4/6 7/6 8/6 16/6 20/0 26/6	1/6 2/0 2/6 3/6 4/6 4/6 5/6 6/0	3/0 4/0 5/6 7/0 10/0 11/0 11/0 12/0 14/0	6/0 8/0 11/0 13/6 16/6 16/6 22/0 24/0 26/0	7/6 11/0 13/0 14/0 17/6 17/6 26/0 31/0 40/0	15/0 20/0 22/0 24/0 32/6 32/6 42/0 50/0 65/0	

Bromide Enlargements or Contact Prints. ON OPAL. Any size up to ½-plate.

Number	Black	Sepia	Finishing or Moi	in Black as		Finishing in Water Colours, extra			
Copies White			3rd Class	2nd Class	Ist Class	3rd Class	2nd Class	Ist Class	
Single Copy 3 from same Neg.	1/9 Each 1/6 1/4	2/4 Each 2/0 1/9	1/6 Each 1/6	3/0 Each 3/0 2/9	6/0 Each 6/0 5/6	4/6 Each 4/0 3/6	7/6 Each 7/0 6/6	15/0 Each 14/6 12/0	
12 ,, ,, ,,	1/2	1/2	1/2	2/6	5/0	3/0	6/0	11/0	

RAINES & CO. EALING.

CARBON ENLARGEMENTS-On Paper.

ender, itelian Green, Portrait Brown, Portrait WNN, UNLESS OTHERWISE ORDERED. . ALL ENLARGEMENTS ARE PRINTED IN STANDARD BROWN, UNLESS OTHE The mounting of our Enlargements is done by means of our DRY-MOUNTING PROCESS. nny—vandrar prown, standard ruppe, warm bisck, bagraving black, b ad Chalk Terta Cotta, Chocolate Brown, Ruby Brown, Dark Blue, Sea Green ALL ENLARGEMENTS ARE PRINTED IN STANDARD BROWN, UI Sepia, Red Chalk, Purple, ALL EN N.B.—The mounti

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SIZE of IVORY	IAXIA	24×13	$2\frac{1}{2} \times 2$	3 × 25	35×24	34×3	4×34	
PRICE—Enlarged or Reduced	0/9	5/0 5/6	0/2	7/0 8/0	0/6	9/6	10/0	12/0
r rolli Customers own Negatives	2/0	0/0	0/0	0/0	0/0	0/0	0/0	
1st Class. Finishing in Water Colours (extra)	40/0	40/0	0/09	100/0	130/0	130/0	130/0	_
2nd Class "	20/0	20/0	30/0	20/0	0/29	65/0	65/0	
								1

PRINTING Silver, P.O.P., Platinotype, Gaslight, and Collodio-Chloride.

SIZE	Silver or P.O.P. Unmounted, per doz.	Gaslight, Collodio-Chloride, Unm'd, per doz.	Platinotype, Unmounted, per doz.	Japine & Sepia Platinotype, Unmounted, per doz.	Mounting, Spotting and Burnishing on mounts supplied per doz.	Best G.B.E. Mounts & Mount- ing per doz.	Mounting on 1st quality Plate Sunk Mounts, Jap Vellum, Art Paper, per doz.	Mounting on 2nd quality Plate Sunk Mounts, per doz.
3½ × 2½ Cde-V 4½ × 3½ 5 × 4 5½ × 4 Cabinet 7 × 2½ No. I	1/0 1/3 1/9 2/0	2/3 2/9 3/6 4/0	2/6 3/0 4/0 5/0	3/0 3/6 4/6 5/6	-/5 -/6 -/6 -/8	-/9 1/0 1/3 1/5	1/0 1/4 1/9 2/6	-/10 1/1 1/6 2/0
Panoram 6 × 43 7 × 3 Promenade 12 × 3 No. 4		4/6 4/6 5/6	5/6 5/6 6/6	6/0 6/0 7/0	1/0 1/3	2/0 2/9	2/6 3/0	2/3
Panoram 7 × 5 8½ × 6½ 9 × 7 10 × 8 11 × 7 Panel	3/6 3/6 4/0 5/0 6/6	6/0 6/0 7/6 9/0 10/0	7/6 7/6 9/0 9/6 12/0	8/6 8/6 10/0 10/6 13/0	1/4 1/9 2/3	3/0 3/6 4/6 5/3	8/0 5/0 7/0	3/0
II × 9	8/0 9/0 10/0	12/0 14/0 16/0	13/0 16/0 19/0	14/0 18/0 21/0	2/3 2/3 2/6 3/6 4/0	4/6 5/3 8/6 8/6	8/0	6/0
12 × 7½ \ 12 × 10 \ 15 × 12 \	18/0 29/0 32/0	25/0 36/0 55/0 60/0	30/0 45/0 80/0 84/0	33/0 50/0 85/0 90/0	5/0 9/0 12/0 15/0	13/0 30/0 60/0	10/0 18/0 30/0	7/0 13/0 21/0

Carbon Printing.

COLOURS.-Standard Brown, Standard Purple, Warm Black, Engraving Black, Brown Black, Sepia, Warm Sepia, Cool Sepia, Red Chalk, Terra Cotta, Chocolate Brown, Ruby Brown, Dark Blue, Sea Green, Italian Green, Portrait Brown, Portrait Purple.

	SI	NGLE T	RANSF	ER	DC	UBLE '	TRANS	FER
SIZE	Paj	per	O	pal	Pa	per	O	pal
	Each	Doz.	Each	Doz.	Each	Doz.	Each	Doz.
4½ × 3¼ · · · · · · · · · · · · · · · · · ·	-/4 -/6 -/8 -/9 1/2 1/8 1/8 2/3 3/0	3/6 3/6 4/6 6/6 8/6 12/0 18/0 18/0 22/0 33/0 42/0	1/0 1/0 1/3 1/6 2/0 2/6 3/9 3/9 6/0 8/0 10/6	11/0 11/0 13/0 16/0 22/0 25/0 41/0 62/0 88/0 110/0	-/5 -/5 -/6 -/9 -/10 1/6 1/9 1/9 2/6 3/3 4/0	4/0 4/0 4/6 7/6 9/0 14/0 20/0 20/0 25/0 36/0 45/0	1/0 1/0 1/4 1/9 2/3 3/0 4/6 4/6 7/0 10/0 14/0	10/6 10/6 13/6 18/0 24/0 30/0 48/0 72/0 108/0 136/0

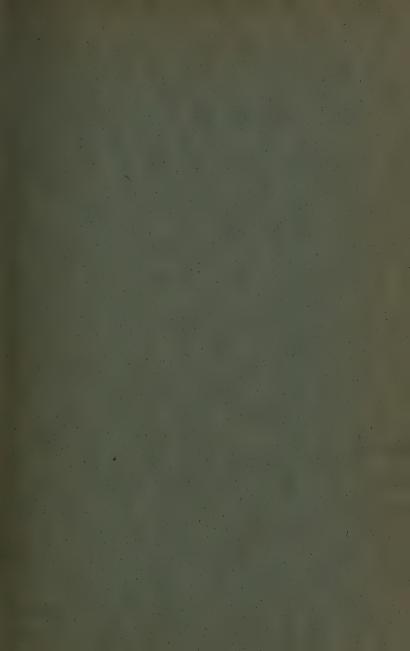
CARBON TISSUE COLOUR CHARTS.—We supply these Charts containing 17 colours which we use for Carbon printing, at the price of 1/-. These Charts are of great use as a guide to colour required.

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- ¶ A special feature of our business is the department devoted to the mounting and framing of exhibition photographs. Our facilities for this work are unique.
- ¶ For one thing we have a stock of over one hundred different mounting papers—British, Continental, American and Japanese. Of some of these we have the sole English agency.
- ¶ As to framing it should be obvious that a firm devoting itself exclusively to photographic work is in a better position to undertake the framing of photographs than is the ordinary framer, with whom such work is necessarily but an occasional side line.
- ¶ Typical of the expressions of opinion we are constantly receiving is the following written by Mr. Jas. Shaw of Manchester, a well known exhibitor and prize winner:
 - "I am delighted with the mounting and your selection of tints and must express my thanks for the very careful handling you have displayed in dealing with the Oil Prints. I shall soon send you another another 20 or 30 to mount."
- ¶ Mr. F. J. Mortimer, F.R.P.S., the editor of "The Amateur Photographer and Photographic News," writes:
 - "When it is realised that this firm is prepared to place the knowledge, skill, and artistic taste here displayed at the services of every customer, there is no doubt a great number of exhibition prints will find their way to Ealing for treatment."

Some Appreciations.

- Captain Owen Wheeler, writing in "The Telephoto Quarterly," says:—
 "My good friends, Messrs. Raines & Co., whose name is familiar in men's mouths as a household word in everything to do with very high-class reproduction and especially enlarging."
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- Major A. B. Stone, 2nd Cheshire Regiment, Madras.—"The prints that you made and mounted for me arrived this mail. I am extremely pleased with them and the best way I can show my satisfaction is by sending you a great many more to do. It is a real pleasure to have one's negatives printed as you do the work."
- W. A. Knight, Esq., Clifton, Bristol.—"I think I owe it to you to say that my wife and I are very pleased with the way the framed enlargements have been done; they certainly reflect great credit on your staff and we shall recommend anyone who wants similar work to come to you."
- Henry J. Morden, Esq., Brixton.—"You have done excellently in regard to the enlargement; I did not expect that it would turn out so well. I shall certainly recommend your firm in the press as well as to inquirers."
- H. Formby, Esq., R.N., "H.M.S. King Edward VII."—"I am more than satisfied with the enlargements and the exquisite way in which they were mounted. You may be quite certain that I shall come to you again for enlargements."
- Rufus E. Evans, Esq., M.D., Newcastleton.—" I wish also to thank you for all the trouble you have taken on my account. The frames you made for me are excellent and your charges exceedingly moderate."
- H. P. M. Berry, Esq., Melbourne, Australia.—"I have much pleasure in expressing my complete satisfaction with all you have done. It will give me great pleasure to recommend your excellent and skilful work to all my friends."
- Eric Burder, Esq., Loughborough.—"I have sold eleven of these at the Preston Exhibition and I am sure that a large amount of my success is due to your framing of the picture."
- S. C. Aylott, Esq., Luton.—"I have received the framed carbon enlargements and wish to say they are indeed very nice and make two splendid pictures. I am quite satisfied."
- D. Dickinson, Esq., Zastavskaia, St. Petersburg.—"I am much obliged to you for the enlargements which arrived this morning; they are quite a revelation to me in the possibilities of artistic work."



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in—"Every print, every
enlargement, the best
result the negative
:: :: will yield." :: ::

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THE "SIBYL" Pocket Cameras.

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Outside Measure-

		ment v		losed.	mate Weight	
1 PLATE.	Title.	,	inches.	•	of Camera.	Complete.
Model No. 1.	"De Luxe"	6	× 41	x 15	26 oz.	21 0 0
	(Double Extension)				-	28
" No. 2a.	"Special," f/4.8	57	× 4½	× 1,7	20½ oz.	16 16 0 2b
" No. 2b.	"Special," f/4.5)				(17 17 0
,, No. 8.	"Tessar" Cooke".	57	× 41	× 178 × 178	20½ oz. 19¾ oz.	14 14 0 14 0 0
" No. 8.	"Tessar" Imperial	57	× 41	× 1,7	ZUZ UZ.	16 16 0
., No. 9.	"Cooke" Imperial —Imperial Models hav	51	× 41	× 1,7	20 oz.	16 0 0
	Reflector Finder.	. 0 2100 0	002	900000	21. 60 01. 10.	iditig.
$3\frac{1}{2} \times 2\frac{1}{2}$ PLATE Model No. 7.	$(6\frac{1}{2} \times 9 \text{ c/m.})$ "Special" $(f/4.5)$	54	x 3.8	× 13	161 oz.	13 13 0
" No. 5.	"Special" (f/4·5) "Tessar" "Cooke"	518	× 318	× 118 × 118	133 oz.	10 10 0
" No. 6.	"Cooke"	516	× 318	× 118	135 oz.	9 9 0
	ACC	ESSO	PIE	S.	3½ × 2½ Plate	
"Sihvl" Char	nging-Box, Form 1 fo	r 8 Pla	tes or	8 Film	£ s. d.	£ s. d.
or Form	2 for 12 Cut Films				2 5 0	2 5 0
"Sibyl" Char	ging-Box, Form 1 for 2 for 18 Cut Films	12 Plat	es or 1	2 Film	s, 2 7 6	2 7 6
Special Film	Pack Adapter				1 10 0	1 15 0
Extra Leathe	r Case containing 6	Dark SI	ides n	umbere	. 0 11 6	0 15 0
Extra Dark 8	lides, each				. 0 1 6	0 1 6
Ground Glass	eens, complete with fi (real image) View Fin	der with	Level	ls :	. 0 3 6	0 4 6
Light Filters	in Case				0 10 6	0 10 6
	ites, per dozen				acked 1/3 1/6,	0 2 6
	s, each				. 0 0 4	0 0 5
Antinous Rele	nes, each		* *		. 0 7 6	0 7 6
Tripod Board	and Screw (for Tripod ripod complete in Lea	Work)			1 10 0	0 10 6
	to Attachment, includ				. 3 0 0	3 0 0
					To 1-Plate	To 1/1 Plate
The New Fold	ling "N. & G." Enlarg	er, "Sil	oyl" 1-	plate	. 3 15 0	4 5 0
The New Fold	ing "N. & G." Enlarg	ger, 3½ ×	21	• •	3 5 0	3 17 6

The "SIBYL" POCKET CAMERAS.

Provided with Lenses of first quality only, so that the negatives will bear enlargement to any size: 15 × 12 in. pictures being quite possible withou serious loss of sharpness.

The weight of the "SHYL" Camera with one Dark Slide in position is \(\frac{1}{2}\)-plate \(\frac{21}{2}\) ounces, and \(\frac{3}{2}\) \(2\frac{3}{2}\) plate, \(1\frac{5}{2}\) ounces. In spite of the diminutive size, no point essential to complete efficiency has been sacrificed. The Shutter works automatically at



measured speeds between the extremes of ½ and 100 sec.; and "Time" exposures can also be given. When open, the "SIBYL" is rigid and steady, and its side-struts and base afford a good comfortable hold for use. Being constructed entirely of

metal it cannot be affected by change of climate.



SPECIAL "SIBYL." Model No. 2. Designed expressly to take the Large Aperture Lenses, suitable for Instantaneous High-Speed Work, Portraits, Groups, Etc., Etc.

The demand for a compact form of Hand Camera has been carefully considered, and the following particulars of the "SIBYL" should prove interesting to those seeking a really efficient instrument, capable of producing work of the highest excellence. We can confidently recommend it to those photographers requiring a Perfect Apparatus.

The "SIBYL" is a Real Pocket Camera, i.e., a Camera—complete, serviceable, and efficient in a high degree—that can be carried in an ordinary pocket without inconvenience. The dimensions have been reduced to a minimum, as follows:—½-plate, closed, 5% × 4½ × 1½, 3½ × 2½ plate, closed, 5% × 4½ × 1½, 3½ × 2½ plate, closed, 5% × 5% × 1½.

NEWMAN & GUARDIA, Ltd., 17 & 18, Rathbone Place, Oxford Street, London, W.

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"N. & G." SQUARE-REFLECTOR



S .- R. Camera opened. Showing the new Folding Hood drawn up, and the Front extended for Copying full size.

HE "N. & G." Reflex Self-Focussing Camera shows the image to be photographed right up to the moment of exposure, and in the same degree of size and brightness in which it will fall on the plate. It thus entirely removes the two great difficulties in Photography: the Guessing of Distances and the

Estimating of Exposures. It ensures Dead Accuracy

of Focus and Correctly

timed Negatives under all conditions, and renders the mechanical adjustments necessary for taking a Picture practically autuomatic.

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Closed, for carrying.

NEWMAN & GUARDIA, Ltd.,

17 & 18, Rathbone Place, Oxford Street, London, W.

-plate.

Catalogue Free. Postage 4d.

Prices and Accessories of the "N. & G." Square Reflector Reflex.

With Zeiss "Double 3\frac{1}{2} \times 2\frac{1}{2} 5 × 4 or Protar" Anastigmat, plate. 4-plate. 9×12 c/m. 2-plate. giving 2 foci, and 3 Double Dark Slides ... £30 0 0 £35 0 0 £40 Without Lens, but including cost of fitting a Suitable Lens (from) £25 0 0 £27 10 0 £32 0 0 £40 0 0

Lenses fitted & recom-mended : Zeiss No. 1 Special. 10. 16.3 $7\frac{1}{8}$ in. $\frac{1}{8}$ in. $\frac{1}{8}$ in. $\frac{1}{8}$ in. $\frac{1}{8}$ in. $\frac{1}{8}$ in. $\frac{1}{8}$ in. $9\frac{1}{2}$ in. $11\frac{3}{16}$ in. $13\frac{3}{4}$ in. tars," Series VIIa. f/12.5f/12.5.f/12.5.f/12.5.

Strong Velvet-Lined Leather Case, with $3\frac{1}{2} \times 2\frac{1}{2}$

good Lock and Fittings, plate. 5×4 4-plate. to hold Camera, Slides. and Sundries £1 10 0 £1 15 0

£2 10 0 "N. & G." Reflex Tele-

£5 15

£5 15

photo, including Adapter, and Marking degrees of Amplification

"N. & G." Changing Boxes, for 12 Plates or

Films, or 24 Films, each £2 5 0 £2 5 0 £2 15 0 £3 15 Set of 6 Single Metal Slides, with daylight-1-plate. changing Adapter and Leather Case ... £1 15 0

Special Film-Pack Adapter, for the new daylight-changing Packs of Isochromatic Films

£0 12 6 Supplementary Shutter for long automatic

Exposures; Modified Linhof, including cost of fitting, and Pocket Case

£3 10 0 Case and Covering.—All Woodwork is well-seasoned Mahogany, and every board clamped and cross-tongued. All joints are fitted and screwed together, to stand the most severe strain. Metal Parts Magnalium, for lightness, wherever possible. Covered throughout with Real Black Morocco selected for wear and appearance.

The "N. & G." Reflex is made entirely at our London Factory. under personal supervision. Every detail is perfect in Design, and the Workmanship and Finish are those of a High-class Scientific Instrument.

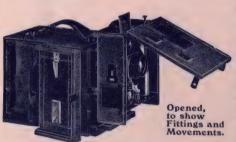
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Catalogue Free.

The "N. & G." UNIVERSAL

For HAND and TRIPOD WORK.

CAMERA



THE "N & G." Universal is the best Camera for All-round Work. It takes all kinds of Sensitive Material, and is as efficient on a Tripod as in the Hand. While so simple in design that it is the easiest Camera to use for all ordinary subjects, it contains, in reserve, every Adjustment required in Photography, and can readily be adapted for Wide-Angle, Telephotographic and other Special Work as well.

Postage 4d.

PATTERN B.—For Zeiss "Tessar," Goerz "Double Anastigmat,"
Ross "Homocentric," and any other Single Focus Lenses.
This is the "N. & G." Universal in the simplest possible form. It
differs from the 2-Foci Special B only as regards the Lens; it is identically the

same in every other respect, and is the pattern we usually make to fit Customers' own Lenses.

With Zeiss new "Tessar"	7-E	olat	e.	5×4 or 9×12 c/m	$5\frac{1}{2} \times 3\frac{1}{2}$ (Post Card)	½-pl	ate	-
f/6·3 Anastigmat	£18	0	0	£21 10 0	£24 0 0	£28	0	0
Without Lens, but includ- ing cost of fitting any	0.0		•	040 5 0	010 10 0	200	•	
Suitable Lens (from)	£13	15	U	£16 5 0	£18 15 0	£20	U	0

SPECIAL PATTERN B=2 FOCI.-For Convertible Lenses with

similar Combinations. As neat and light as the ordinary Pattern B; its range of focus is amply sufficient for any but the most extreme work. The maximum aperture is f/6.3. VII.A 1-plate. 58 × 38 1-plate. With Zeiss Series Double Protar"Anor 9 x 12 c/m (Post Card) astigmat, Nos. 4, 7, and £28 0 0 £32 0 0 10 respectively ... £22 10 0 £26 0 0 Without Lens, but includ-ing cost of fitting any £15 5 0 £17 5 0 £19 15 0 £21 5 0 Suitable Lens (from)

NEWMAN & GUARDIA, Ltd., 17 & 18, Rathbone Place, Oxford Street, London, W. Catalogue Free.

Postage 4d.

The "N. & G." De Luxe Camera.

For HAND and TRIPOD WORK.



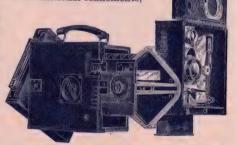
Closed, as carried ready for Work.

regular "N. & G." Universal Camera is, and will probably always remain, the best. It is the outcome of seventeen years' constant evolution and improvement, and not only provides every essential for modern Photography, but is so simple to use, and free from complications, that it is the most reliable Apparatus, both in the hands of Beginners and of Experts working in trying climates or under difficult

It is also offered at a cost which places it within reach of every one who appreciates a high-grade standard article.

Still, in the course of time, we have had occasion to make many important improvements in details in order to meet individual requirements, and have been able to devise additional refinements.

and have been able to further increasing the usefulness of the Universal for particular purposes. The introduction of the "N. & G." Reflex has also made Photographers acquainted with entirely new features in Camera construction which are greatly appreciated.



Opened, to show Fittings and Movements.

NEWMAN & GUARDIA, Ltd.,

17 & 18, Rathbone Place, Oxford Street, London, W.

Catalogue Free. Postage 4d.

Prices and Technical Data of the "N. & G." De Luxe.

Made in $\frac{1}{4}$ -plate ($4\frac{1}{4} \times 3\frac{1}{4}$ in.) size only.

Price with Zeiss "Double Protar" Anastigmat, giving 2 fooi:

Open-Back Pattern, with any Plate or Filmchanging Device £30 0

Closed-Back Pattern, with either 8-plate Box

and Screen, or 12-plate Box Lens fitted Ziess "Double Protar," Series VIIa., No. 4—5 in., f/6.3; 9 in., f/12.5.

Open-Back Pattern.

 Weight
 ...
 ...
 2 lbs. 14 oz.

 Measurement
 ...
 ... $6\frac{3}{4} \times 5\frac{1}{4} \times 5\frac{1}{4}$ in.

 Maximum Extension
 ...
 11 in.

Closed-Back Pattern.

Weight, with Box and Screen ... $4\frac{1}{4}$ lbs. Measurement $8\frac{3}{4} \times 5\frac{1}{4} \times 5\frac{1}{4}$ in. Maximum Extension 11 in.

Range of Shutter Speeds 1 sec. to 1/200th sec.

The "Nydia" Folding Camera.

The "Nydia" is an old favourite which has won a world-wide reputation as the Acme of Lightness combined with the Highest Efficiency. It differs from all other folding Cameras



Opened, Ready for Work.

in that it is neat and small, by virtue of its Careful Design, and not at the sacrifice either of the quality of its parts or of the rigidity and reliability of the whole. The Workmanship and Finish of every detail are fully up to the "N. & G." Standard, the low price, for so complete an Instrument, being due solely to the use of special machinery for many of its parts, and to the ever-increasing numbers which we make from year to year. The "Nydia" is the smallest Complete Camera made for full \(\frac{1}{2} \) or \(\frac{1}{2} \) plates.

PRICES OF "NYDIA" CAMERA.

Complete with One Box and Leather Case.

With Aldis f/7·7 Anastigmat Lens £7 15 0
With Ross f/6·3 "Homocentric" Lens ... £10 10 0

£10 10 0 £18 18 0 Stereoscopic. £19 19 0

3-plate.

With two accurately paired Ross f/6·3 Ster
"Homocentric" Lenses. ...
(Cases of Nos. 2 and 2S Velvet lined and fitted with Cycle Straps.)

NEWMAN & GUARDIA, Ltd., 17 & 18, Rathbone Place, Oxford Street, London, W.



Nic. Perscheid Berlin

Taken with ZEISS "TESSAR"

CARL ZEISS 29, Margaret Street Regent Street

LONDON W.
Telegrams: "Diactinic London" Telephone: 4007 Central

Minimum-Palmos

made of light metal with focal plane shutter for the most rapid instantaneous exposures.

For Hand and Stand Use.



 $31/2 \times 21/2$, $41/4 \times 31/4$ and 5×4 in.



 $63|_4 \times 31|_4$ in. Panorama $(31|_4 \times 31|_4) + (31|_4 \times 31|_4)$ Stereo.

Price including 3 D. D. Slides and 1 Leather Case I for

31/0×21/0 in.

with Tessar, Series IIb, f/6.3, Eq. Focus 4.4 in. £ 13. 8.0 with Tessar, Series Ic, f/4.5, Eq. Focus 4.4 in. £ 13.18.0

41/4×31/4 in.

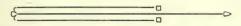
with Tessar, Series II b, f/6.3, Eq. Focus 6 in. . 2 14. 4.0 with Tessar, Series Ic, f/4.5, Eq. Focus 6 in. . 2 15.16.0

5×4 in.

with Tessar, Series II b, f/6.3, Eq. Focus 6 in. \mathscr{L} 14.19.0 with Tessar, Series Ic, f/4.5, Eq. Focus 6 in. \mathscr{L} 16.11.0

$6^{3}/_{4}\times3^{1}/_{4}$ in. for Stereo and Panorama

with Tessars, Series IIb, f/6.3, Eq. Focus 5.4 in. 22. 9.0 with Tessar, Series IIb, f/6.3, Eq. Focus 7 in.





Taken with Minimum-Palmos 5×4 in. and Tessar.

Stereo-Palmos $4^{1}/4 \times 3^{1}/4$ in. (9×12 cm)

made of light metal with focal plane shutter. Stereograms, Panorams and Snapshots by Hand or Stand.





Snapshots 41/4 × 31/4 in. 1123



Panorams 41/4×31/4 in.

Price including 3D, D, Slides and 1 Leather Case I.

1. Equipment for Stereograms and **Panorams**

2 Tessars, Series IIb, f/6.3, Eq. Focus 3.3 in. . £ 19.12.0

2. Equipment for Stereograms, Panorams and Snapshots

2 Tessars, Series IIb, f/6.3, Eq. Focus 3.3 in. and 1 Tessar, Series IIb, f/6.3, Eq. Focus 6 in. . . £ 24.12.0

3. Equipment for Snapshots, 1/4 Plate

Tessar, Series Ic, f/4.5, Eq. Focus 6 in. . . £ 17, 4.0 or Tessar, Series IIb, f/6.3, Eq. Focus 6 in. . £ 15.14.0

4. Adaptation for close range Stereograms £ 5, 5.0



Reg. B. Lodge, Enfield

Taken with Zeiss "Magnar"

ZEISS-MAGNAR 1:10, Eq. Foc. 18 in.

Rapid Tele-Objective for 1/4-plate hand cameras.

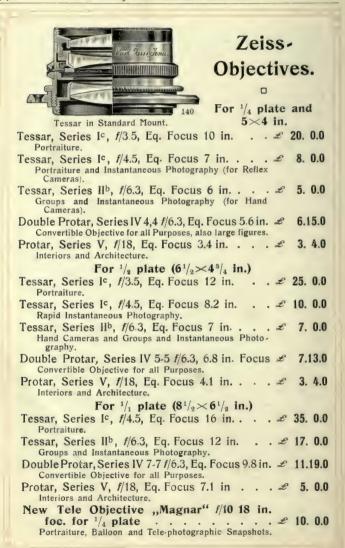
Zeiss-Magnar 1:10, Eq. Foc. 18 in. in focus- sing jacket, for rigid ¹ / ₄ -plate hand cameras,	£ s. d.
about 6 in. extension	10.0.0
The camera should be sent on for adaptation; usual cost of adaptation	10.0
Goergen's Special Shutter No. VI, including	
cost of adaptation	1.3.0 7.0
Yellow Glass Filter × 5 for Zeiss-Magnar	
Case for Zeiss-Magnar	





Frau Generalin von Igel, Exc. Berlin W.

Taken with Zeiss-Magnar 1:10; f=18 in.



KODAK

LIMITED

57-61 Clerkenwell Road, London, E.C.

96 Bold St., Liverpool; 89 Grafton St., Dublin; 2 St. Nicholas Buildings, Newcastle; 3 Victoria Sq., Birmingham; 72-74 Buchanan St., Glasgow; 59 Brompton Rd., S.W.; 60 Cheapside, E.C.; 115 Oxford St., W.; 171-173 Regent St., W.; 40 Strand, W.C.

The following pages contain brief particulars of but a few of the Kodak manufactures. For further information consult

The KODAK CATALOGUE

and special booklets and leaflets which will be sent post free to anybody naming this almanac.

To the Amateur

Kodak Ltd. offer a wide choice of cameras embodying the latest ideas in design and construction; perfect negative media in the shape of Kodak Roll Film, Eastman Plates and the Premo Film Pack; Developing Tanks; a large variety of printing papers, etc.

To the Professional

Is devoted a special department, prepared to undertake the complete equipment of the studio, reception and workroom.



The BROWNIE KODAKS

—four splendid box-form cameras constructed on the Kodak daylight loading principle—have introduced thousands to the pleasures of picture making. A child can use them.

No. I $2\frac{1}{4}'' \times 2\frac{1}{4}''$ 5/- No. 2 $3\frac{1}{4}'' \times 2\frac{1}{4}''$ 10/- No. 3 $4\frac{1}{4}'' \times 3\frac{1}{4}''$ 17/6

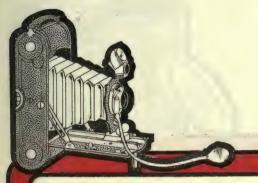
The FOLDING BROWNIES

embody all the features of the box-form models with the additional advantage of folding form, and have the extended scope given by their focussing movements.

No. 2 $3\frac{1}{4}$ " \times $2\frac{1}{4}$ " 21/-No. 3 $4\frac{1}{4}$ " \times $3\frac{1}{4}$ " 37/6 with R.R Lens No. 3a $5\frac{1}{2}$ " \times $3\frac{1}{4}$ " 42/- ,, ,

The STEREO BROWNIE

Price 50/-



The FOLDING POCKET KODAKS

are recognised wherever photography is practised as the perfection of pocket camera design and construction. They are made in seven models, which divide themselves into THREE TYPES.

No. I $3\frac{1}{4}'' \times 2\frac{1}{4}''$, No. Ia $4\frac{1}{4}'' \times 2\frac{1}{2}''$. Fixed focus cameras with first-class single lenses, iris diaphragms, time and instantaneous shutter, reversible finder, opened and extended by a single movement. No. I 42/-; No. Ia 50/-.

No. 1a Special

No. 2 .. $3\frac{1}{2}$ × $3\frac{1}{2}$ × $3\frac{1}{2}$ ×

Superior equipment consisting of high-class Rapid Rectilinear lens, automatic focussing device, pneumatic and trigger shutter release, price £3/3 each.

No. 3 . . 4½" × 3½" No. 3a . . 5½" × 3½" No. 4 . . 5" × 4"

Focussing cameras embodying all the features of the previous models, and rising and falling front, No. 3 72/6, No. 3a 90/-, No. 4 90/-.



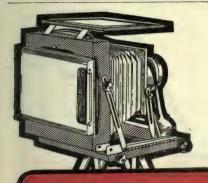
TANK DEVELOPMENT

is the best possible treatment for your roll films, whether over, under or correctly exposed, whether they are time or instantaneous exposures.

And apart from the technical superiority of negatives developed in the **KODAK TANK** there is the convenience and the comfort of the method—no dark room is required; you simply put the film in the tank.

Made in four sizes: Brownie 10/-, $3\frac{1}{2}$ " 21/-, 5" 26/-, 7" 32/6.

THERE IS ALSO A TANK FOR PLATES AND ANOTHER FOR THE PREMO FILM PACK . . . FULL PARTICULARS POST FREE.



The PREMO

contains twelve flat orthochromatic films and can be applied by means of a simple adapter to most of the cameras constructed for use with glass plates.

The illustration shows an ordinary field camera provided with a Premo Film Pack Adapter, which serves the purpose of six double dark slides.

> THE PACK IS LOADED IN DAYLIGHT AND EVERY PICTURE CAN BE COM-POSED AND FOCUSSED ON THE GROUND GLASS. TO CHANGE THE FILMS YOU SIMPLY PULL A PAPER TAB.

Every plate camera user should make himself acquainted with the Premo Film Pack System.



KODAK N.C. FILM.

The only genuine roll film for Kodaks

Kodak Film has behind it the experience of the best emulsion makers, and shows such perfection in every detail that there is nothing to be gained by experimenting with a substitute.

THE GENUINE FILM FOR KODAKS IS ENCLOSED IN A YELLOW CARTON BEARING THE LETTERS "N.C." IN A BOLD DEVICE, PRINTED BLUE, RED OR GREEN ACCORDING TO THE NUMBER OF EXPOSURES.



EASTMAN PLATES

Rapidity, latitude, fine grain, uniformity and ease of manipulation make the Eastman Plate

THE MOST DESIRABLE NEGATIVE MEDIUM.

Rapid, Extra Rapid, Special Ultra Rapid and Orthochromatic.

For all subjects of which correct colour renderings are essential use

"Eastman Orthochromatic."

RANDICIRS

Are of the billions possible mality, a many

SOLIO

Printing-Out Paper-Glossy, Matte and \

Solio, Aristo and Kodak Collodion Self-Toning Papers

Closev and Matte. Require fixing the

Kodak Bromide Papers.

Royal, White beach, Permane Velvet and Nikko.

Velox and Dekko.

I cinted and developed in gaslight

Rodak Platinum Paper.

Smooth, Medium and Rough.

Hodak Postcards.

Solio, Arisa seif-Toning, Kodak Self-Toning Collodia. Delko, Velox and Bromide.



A NEW BOOK JUST PUBLISHED THE PHOTOGRAPHER'S

Note Book on Lenses.

POST FREE GRATIS

on application.

96 pages of useful information on Lenses— Focus, Depth, Rapidity, Perspective, Rising-Front, Swing Back, Angle of View, &c., &c., clearly explained.

2977 It is not so complete as the 1/- book mentioned below, but gives the information required by the photographer in a more condensed and simple form.

"PHOTOGRAPHIC LENSES."



(A simple Treatise by Conrad Beck and Herbert Andrews).

PRICE 1/-

Post Free, 1/3.

"The British Journal of Photography" says:— "The book throughout is written with singular lucidity of style, and contains little or nothing of a mathematical nature calculated to deter its perusal by non-mathematical readers. The book is a sound piece of work, and in strongly recommending it we trust it will be widely circulated."

350 Pages, 45 Engravings and 150 Diagrams.

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on application.

"PRACTICAL NOTES ON TELEPHOTO-GRAPHY."

This is a 64-page pamphlet, profusely illustrated, explaining the principles which underlie Telephotography, and giving full working instructions.

R. & J. BECK, Ltd., 68 Cornhill, London, E.C.

THE BECK

ISOSTIGMAR LENS.

The "Isostigmar" Anastigmat lens, possessing as it does all the sup qualities of the finest and most expensive Anastigmat lenses yet product and being much less expensive to manufacture, has won immediately enormous success. There is no reason to pay more for an Anastigmat. You cannot get a more perfect lens. We have now succeeded in developing capabilities of the new optical principle on which this lens was invented, a have introduced five new series of the Isostigmar, so that every branch Photography is now covered.

There are seven series.

Series	I.	Aperture	f	4.5.	An	gle	60°.	3	in.	to	12 in.	focus.
Series	la.	,,	f	6.5.		2 2	60°.	9	9.9		19	
Series	II.	,,	f	5.8.		2 0	70°.	2 <u>3</u>	27		8	,,
Series 1	III.	,,	f	7.7.		2 3	65°.	44	,,		$9\frac{1}{2}$	0.7
Series	IV.	,,	Í	6.3.		, ,	90°.	$3\frac{1}{2}$	2.0		$7\frac{1}{4}$	2.7
Series	V.	,,	f	11		,,	60°.	12	2.7		30	22
Series \	VI.	21	f	5 ·6.		,,	60°.	91/2	2.7		17	17

The general characteristics of the Isostigmar are described below, while special characteristics of the various series are fully described in "I Photographer's Note Book on Lenses," post free gratis on application.

Optical Qualities of the Isostigmar.

The optical properties of this Lens are very remarkable. It has a prically flat field, free from astigmatism, at the same time the oblique spheriaberration and the central aberration are so completely corrected that definition at the edge of the field is as perfect as in the centre, thus give superb definition at the full aperture of the lens.

The following are extracts from a test certificate made at the Nation Physical Laboratory.

"DEFINITION at the centre with the largest stop EXCELLENT. I stop marked F5.8 gives satisfactory definition over the entire plate.

"CENTRAL SPHERICAL ABERRATION. The plate having been focussed at the centre of the field with the largest stop, for an indefinitely distant object, the movement necessary to bring it into focus, when the aperture employed is limited to a zone of the lens, lies between + 0.00 cm. and — 0.00 cm. The observations are usually made for zones of width, one sixth of the diameter of the largest stop.

"ACHROMATISM. The plate having been focussed at the centre of the field for white light, the movement necessary to bring it into focus for blue light (approximate wave length 440 u u) is 0.00 cms., and for red light (approximate wave length 656 u u) is — 0.02 cm.

"The continuous black curve shows the position of the best focus for radial lines and the dotted curve for transverse lines, relative to the photographic plate. For this lens these lines coincide, the ASTIGMATISM being practically NIL."

The above test shows that the lens possesses absolutely no spherical or Zonal aberration, no astigmatism, and that the colour correction is practically perfect, † per cent. error only.

The Isostigmar is a 3 Foci Lens.

The construction of the Isostigmar allows it to be used as three separate lenses, as either the back or front combination can be used separately with small stops; thus the half-plate Series II. lens, which has a combined focus of 7½in., has a front lens of about 11in. focus and a back lens of about 13in. focus, thus making three lenses in one.

There is an advantage in the particular form in which the Isostigmar is made up. The lens is so constructed that the back combination can be screwed into the front of the mount and not used in the back as is usually done. The result of this is that the extension required in the camera is reduced. As the back combination is longer than the front, be careful to see when using this combination in the front of the mount that the lens does not press upon the iris diaphragm or leaves of the shutter. If this is the case a short adapter or lengthening tube should be used.

For telephotography, the Isostigmar is particularly suited, being a perfectly corrected positive element for this class of work; the large aperture it possesses is also a great advantage. In fact, for all classes of work undertaken by the amateur or professional the Isostigmar will be found most useful, while for the technical photographer who wishes to do copying or three-colour work the lens will be found eminently satisfactory.



SERIES II. & III.

These are the standard series lenses for all-round work.

long	er in fo free.)	cus a	nd me	Junteu	III DIAGO		1	t t	8
No.	Focus Complete. Inches.	Focus Front. Inches.	Focus Back. Inches.	Plate suitable for, at full Aperture.	Plate suitable for, Moderate Stops.	PRICE Aluminium Mount and Iris Diaphragm. PRICE fitted in Oelverex Shutter.	PRICE in Brass Focussing Mount.	PRICE in Flush Mount for Redex Camera.	Size of Flange Screw. Inches.
1 2 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	234 4434 6634 774 81	41 65 71 9 101 11 111	5½ 8 8¾ 11½ 13 13½ 17½	2½ × 1½ 3½ × 2½ 4½ × 3½ 5 × 4 5½ × 3½ 6½ × 4¾ 7 × 5	5×4 7×5 9×7	3 12 6 5 12 6 4 15 0 6 15	3 10 0 3 10 0 3 10 0 4 0 0 4 5 0 4 17 6 6 15 0	3 10 0 3 15 0 4 2 6	1.75

†This size has a full aperture of f/6.3.

SERIES III. f/7.7. Angle 65°.

	SERIES II		6 0 d 1 £	s. d. £	s. d.
4a 02 113	09 ~ 02 1	1 176	3 7 6 3 3 12 6 3 3 17 6 3 4 2 6 3 5 15 0 5	502 762 004	10 0 1·32 15 0 17 6 1·75

These figures may vary a little, but are approximately correct.

The two extra diaphragm scales referring to the single combinations when used sepmay be engraved on the mount at an extra cost of 2/0.

SERIES la, f/6.5. Angle 60° to 65°.

		Approximate focus of 3 combinations.		 Plate su Group Lands 	Price Brass Mo with It	
No.	Focus.	Front.	Back.	Full Aperture.	Moderate Aperture.	Diaphra
7 9 11 12	Inches. 9½ 12 17 19	Inches. 14½ 18 23½ 29½	17\frac{3}{4} 22\frac{1}{2} 36 40	$\begin{array}{c c} 8\frac{1}{2} \times 6\frac{1}{2} \\ 10 \times 8 \\ 12 \times 10 \\ 15 \times 12 \end{array}$	$\begin{array}{c} 10 \times 8 \\ 12 \times 10 \\ 15 \times 12 \\ 18 \times 16 \end{array}$	5 5 9 10 15 0 23 10

For copying, a larger plate can be covered.

BECK. Ltd., 68 Cornhill, London, E.C.



Series I., f/4.5, angle 60°.

This series is specially suitable for Reflex Cameras and Portraiture (see page 54 of "Photographers' Note Book," post free). The large aperture, combined with perfect covering power and fine definition, render it specially suitable for Colour Photography. For Telephotography it is also specially good on account of its great rapidity.

	Ole I					
No.	Focus.	Size of plate covered.	Size of flange screw.	Price in Iris mount.	Price in brass focussing mount.	Price in sunk mount.
2 3 4 5 6 7 9	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	1·32 in. 1·75 ,, 1·75 ,, 2 ,, 2 ,, 2½ ,, 3½ ,,	£3 12 6 4 15 0 5 10 0 7 7 0 8 15 0 12 0 0 19 10 0	£4 10 0 6 0 0 6 15 0 8 12 0 10 0 0 13 10 0*	£4 0 0 5 2 6 6 0 0 7 17 0 9 15 0 12 10 0

Lenses paired for stereo work, 7/- extra. * To order only.

Lenses Nos. 2 to 6 are mounted in aluminium or brass. Nos. 7 & 9 in brass only without extra charge.

Series IV., f/6.3, angle 90°.



For full description of this remarkable lens see page 52 of "Photographers' Note Book," It is a wide angle lens with a larger aperture than ever made as it covers the plate full aperture. It is also, when a long focus is used, a moderate angle lens with enormous covering power for the use of a rising front.

No.	Focus.	Suitable for plate when used as wide angle.	Approximaterising front available.	Suitable for plate when used as ordinary lens.	Approximate rising front available.	Price in Aluminium	mount with iris.	Price	Ceiverez Shutter	SHIMMON.	Price in	Focussing	- Company	Price in	flush mount.	
2	$3\frac{1}{2}$ in.	$\left\{ egin{array}{c} 4rac{1}{4} imes 3rac{1}{4} \ 5 imes 4 \end{array} ight.$	1½ in.	$3\frac{1}{2} \times 2\frac{1}{2}$	13 in.	£3	15 0	£5	5	0		_		£4	2	6
3 4 5	$4\frac{3}{4}$,, 6 ,, $7\frac{1}{4}$,,	$6\frac{1}{2} \times 4\frac{3}{4}$ $8\frac{1}{2} \times 6\frac{1}{2}$ 10×8	2.2	$ \begin{array}{c} 4\frac{1}{4} \times 3\frac{1}{4} \\ 5 \times 4 \\ 6\frac{1}{4} \times 4\frac{3}{4} \end{array} $	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	3 4 5	17 6 4 0 5 0	5	10 16 5	0 6 0	£4 5	15 1 10	0 6 0	4 4 5	5 11 15	6

An equal amount of falling front is also available. Considerably extra rising front may be used if the two extreme top corners are cut off.

Series V., FII. PROCESS LENS.



This series of the Isostigmar Anastigmat I. has been corrected to give an even flatter field to the Isostigmar lenses of other series for copying photo-mechanical printing. As in practice a largerture than f/II cannot be used for reasons of mected with the requirements of Photo-Mechan printing, this lens has been specially corrected this and smaller apertures, with the advantage of an almost absolutely flat field free from aberrat has been obtained.

Together with these lenses we are introdu a series of suitable reversing prisms, which are structed with such accuracy that the fine qual of the lens are not injured by their use.

PRICE LIST.

		Carta-bladen I	1		PRICE.	
No.	Equiv. Focus.	Suitable for Plate Copying.	Distant Views.	Lens.	Prism.	Lens & Pi
9 11 12 13 14	113 in. 17 ,, 19 ,, 24 ,, 30 ,,	$\begin{array}{c} 15 \times 12 \\ 18 \times 16 \\ 22 \times 18 \\ 28 \times 24 \\ 36 \times 28 \end{array}$	10×8 12×10 15×12 18×16 24×20	£ s. d. 6 6 0 9 0 0 12 0 0 17 0 0 28 0 0	£ s. d. 6 15 0 6 15 0 9 0 0 12 0 0 19 0 0	13 1 15 15 21 0 29 0 47 0

Series VI., F5.6. VARIABLE PORTRAIT.

See page 56 "Photographer's Note Book," post free.



This lens used in the manner has the qualities of Isostigmar lens. For portra however, any degree of softner be introduced. It is provided to revolving ring, which shift component parts of the lens enables any degree of brilliance obtained from perfect definition the one hand to perfect fuzzing the other.

(Including Cords and Pulleys for moving Iris diaphragm and diffusion ring from of camera, in Brass Mounts, with Iris diaphragm, etc).

	OI CAI	Head, and		Si	ize of Grou	b or		1 40
No. 7. 9.	9½ 12 17	in	Size of Portrait. C. de V. & Cabinet C. de V. & Cabinet Panel		Landscape $8\frac{1}{2} \times 6\frac{1}{2}$ 10×8 12×10		£ 7 14 22	2000

BECK LENSES.

The Isostigmar holds its own as the best Anastigmat lens yet made, and in its seven series covers almost the whole ground of photography. We also make lenses of the Rectilinear, Symmetrical and Aplanat type, which have been so universally appreciated that the greater portion of the cameras of a moderate price are now sold with Beck lenses. A lens of this type can never rival a good Anastigmat, but they are excellent lenses at a cheap rate.

Full particulars of all our lenses are to be found in our catalogue, and in "The Photographer's Notebook" (post free gratis); they include:

The Beck Steinheil Orthostigmat. Series IV. Aperture f/12. Angle 100° to 110°. Where an angle greater than (90°) given by the Series IV. Isostigmar is required, these lenses are useful, they give excellent results with small Aperture. Fooi, 27 in. to 10 in Prices	£3.	10	0.	to	27	0	0
The Beck Biplanat f/6. A lens of the Rectilinear type specially intended for portraiture, they give a slightly soft focus at full aperture, but orisp definition when stopped down. Foci, 5½ in. to 17 in Prices		15		11		0	
The Beck Double Aplanat, f/7.7 The best form of Rectilinear Lens. Foci, $5\frac{1}{2}$ in. to $14\frac{1}{2}$ in. Prices					5		
The Beck Symmetrical, f/8. A thoroughly good Rectilinear Lens. Fooi, 5 in. to 18 in. Prices	1	5	0	,,	6	0	0
The Beck Wide Angle Aplanat, f/16. Rectilinear Wide Angle Lenses. Foci, 3 in. and 4 in. Prices	1	7	6	,,	2	0	0
The Beck Wide Angle Symmetrical, f/16. Rectilinear Wide Angle Lenses. Foci, 3 in. to 5 in Prices		17	6	,,	1	5	0
The Beck Extra Rapid Rectilinear Portrait Lenses, f/4. Give a Soft Picture at full aperture, made for Studio Work. Foci, 7½ in. to 14 in. Prices	0	40	0		04	^	
These being as expensive as the Isostigmar, and not so g	_	10 are		• •	21 dom		l.

2 more desing as expensive as the 100stry man, and not so you, are now section sold

The Beck Portrait Lenses, Petzval Type, f/3 to f/6. These are the most rapid lenses made, but are only suitable for studio work. Foci, 6 in. to 24 in.

4 15 0 .. 15 0 0

Telephoto Lenses see next page.

LENSES.

BECK Series.* The "Universal" Telephoto Attachments. 8 5 4 3 LOW UNIVERSAL ATTAGHMEN HIGH C В

Description of Illustration .- A-Flange of Positive Lens into which either the positive or Telephoto Attachment C screws. C—Telephoto Attachment with scale of magnification E a Focussing milled head F. D—Positive Lens with Iris diaphgram. B—A second Telephoto Positive Lens with Iris diaphgram. Lens as supplied in Telephoto Pairs to screw into mount C in place of the first lens.

The "Universal" Telephoto Attachments are made in 3 sizes: Low Power, Standard Power, S

and High Power.

TABLES GIVING CAMERA EXTENSION. Necessary with the "Universal" Series of Telephoto Lenses.

Neces	sarv with	the '	Onive	rsai 5	CITOS			
Neces Standard Power.	Magnification Do. Do. Do. Do.	,	No. 0.	No. 1. Inches. 32 51 71 131 17	No. 2. Inches. 5 7½ 10 17½ 22½ 35	No. 3. Inches. 73 115 151 27 341 54	No. 4. Inches. 91 134 184 234 414	No. Inch 10 16 21 37 45
High Power.	Do.	15 5 8 10 15 3 4	45 8 101 16 —	265 75 134 17 26 3 3 5 7 7	10 171 221 35 5 71 10	15½ 27 34½ 54 7¾ 11½ 15½	91 133 183	11 1 2

PRICE. PRICE PRICE in Brass with Focus Suitable for Lenses Diameter Rack and Pinion of Lens. Alumini of Foci, inches. of Lens. No. Inches. Focussing. Inches. 5½ in. 1.90 .90 10 1.20 60000006 91 ,, 1522 1.40 Standard 4.60 45 1.60 Power. 14 16 23 33 4 22 -60 81 ,, 1.90 .90 High 23 16 Power. 1.40 41 1.90 .90 123 2.50 22 O 3.85 O 1.60 Low 10 4.60 Power. 1.90

Cornhill, London, E.C. BECK, Ltd., 68

BECK LENSES.

The "Universal" Telephoto Pairs.*

To provide for those who desire to be completely equipped for Telephotography, we are making selected pairs of two Telephoto Attachments which screw interchangeably into one Rack and Pinion mount, one high power and one low power. This combination enables any magnification to be used under the best circumstances. The mount and the two lenses are packed in a case and form a very perfect outfit.

Beck "Universal" Telephoto Pairs.

No.	1 PAIR.—1-1-plate size, Consisting of Rack and Pinion mount and two interchangeable telephoto attachments, No. 0 High power and No. 2 Low power, in case	£4	10	e
				•
NO.	1Y do., do., with the addition of an Isostigmar f/5.8, Positive lens, No. 3, Series 1., f/6 aperture	7	5	0
27.0	2 PAIR.—5×4 size, Consisting of Rack and Pinion mount and two interchange-		•	
NO.		87	2	
	able telephoto attachments, No. 0 High power and No. 3 Low power, in case	3	2	0
No.	2Y do., do., with addition of an Isostigmar f/5.8 Positive lens, No. 4,			
	Series I. f/6 aperture	8	5	0
No.	3 PAIR 1 plate size, Consisting of Rack and Pinion mount and two inter-			
	changeable telephoto attachments, No. 1 High power and No. 3 Low power,			
	in case	5	55	0
DT.	3Y do., do., with addition of an Isostigmar f/5.8, Positive lens No. 5,	_		
			17	
5	Series 1., f/6 aperture	0	1 /	0
No.	4 PAIR.—Whole-plate size, Consisting of Rack and Pinion mount and two inter-			
	changeable telephoto attachments, No. 2 High power and No. 5 Low power,			
	in case	6	10	0
No	4X do., do., with addition of an Isostigmar f/7.7 Positive lens, No. 7,			
2.0.	Series I., f/6 aperture	10	5	0
	15cries 1., //o aperoure			_

The Beck "Simple" Telephoto Attachments.†



This attachment can be used on cameras of short extension. It can be screwed on behind the ordinary lens. It gives magnifications up to $4\frac{1}{2}$ or 6 times.

It is suitable for all good lenses in any form of mount, and should find its way into every outfit.

The Beck "Simple" Telephoto Attachment.

No.	Element.	For Lens of Focus.	Diameter of Screw of positive.	PRICE.
1 2 3 4a 4	I. I. II. II.	4" to 6" in 5 × 4 B. & L. 5" to 7" in 5 × 4 B. & L. 6" to 9" in 5 × 4 B. & L. For Beck Symmetrical. 6" to 9" in 7 × 5 B. & L.	or flanges up to $1\frac{1}{2}^{n}$ or flanges up to $1\frac{1}{2}^{n}$ or flanges up to $1\frac{1}{2}^{n}$ Lenses in Mount or flanges up to 2^{n}	£1 15 0 1 15 0 2 0 0 2 0 0 2 0 0 2 10 0
6	II.	6" to 9" in 9 × 7 B. & L. 4" to 7" in 7 × 5 B. & L.	or flanges up to 3" or flanges up to 2"	2 50

Practical notes on Telephotography, 64 pages-post free.

The Beck Symmetrical Lens Coupon System.

A Method of procuring one of the finest of Modern Anastigmats.

To make it possible for anyone who possesses a Beck Symmetrical, Beck Double Aplanat, Primus Beck or Thornton-Pickard Beck Symmetrical Lens to obtain one of the finest modern anastigmats at a moderate cost, we have introduced the new "Lens Exchange Coupon Scheme."

If a coupon has not been provided when the lens was purchased, one can be obtained on application to ourselves or any other photographic dealer

Lens Exchange Coupon. O
On the presentation of this
Coupon, together with the lens
to which it is attached, to any
photographic dealer.

The amount allowed for Symmetrical, Beck Primus, or Thornton-Pickar Beck Symmetrical lens in exchange for a lens of a similar size in either series of the Isostigmar lens is: \(\frac{1}{4}\)-plate, \(\frac{1}{2}\)1, \(\frac{1}{4}\)-plate, \(\frac{1}{2}\)1, \(\frac{1}{4}\)-plate, \(\frac{1}{2}\)1 10s

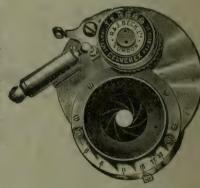
The same amounts will be allowed if the lenses are in Bausch and Lomi Unicum shutters, as the lenses will be fitted into the same shutter. In the case, however, of the half-plate size a larger size Unicum shutter is necessary.

The "Celverex"

This is a photographic shutter which gives accurate speeds. It has four instantaneous speeds of 1/10th, 1/20th, 1/40th and 1/80th of a second also bulb and time exposures. Each shutter is supplied with a test card showing the exact speeds, and it will be found that they only vary from the engraved speeds by a small amount. The principle upon which the "Celverex" shutter has been designed is such that the speeds must of necessity be relatively accurate. The difference in speed is obtained by increasing or decreasing the size of the opening which passes over the lens aperture.

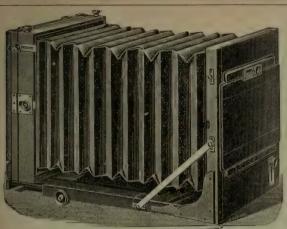
over the lens aperture.
The "Celverex" shutter is exceptionally small and thin, and can be fitted to small folding cameras, as well as those of the larger model.
All makes of lenses can be fitted,

Shutter (Patent).



and many lenses fitted into diaphragm shutters will screw straight into th "Celverex" shutter without alteration.

No. 1, $\frac{7}{10}$ inch aperture, £1 15s. Od. No. 2, $\frac{84}{10}$ inch aperture, £1 17s. 6d No. 3, $1\frac{1}{10}$ inch aperture, £2 5s. Od.



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Finest workmanship throughout, the strongest, most rigid, and best cameras that can be made.

Prices from £6 5 0 to £20 17 0.

For the best professional work, for telephotography, copying and scientific work this earliest form of camera has never been beaten but it is somewhat heavier and bulkier than the more modern forms.

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Swing backs, rack and pinion, rising front, light and very portable but very rigid, suitable for telephotography.

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Cannot be beaten as a field camera.

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1, 1 and 1/1-plate.

Well - made camera, tripod, roller blind shutter and lens complete. Thoroughly sound workmanship and good finish.

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£4 15 0 £7 7 6

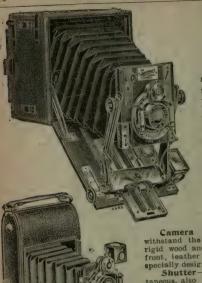
Prices, Isostigmar f/7'7 Lens Ordinary-

1-plate. 1/1-plate £4 7 6 £5 5 0 £8 12 6 Tropical Model--

- £6 15 0 £10 2 6



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THE SANDERSON CAMERA.

A first class camera with all adjustments, can be used either in the hand or on a stand, covered in This camera fitted with either one or two Isostigmar lenses forms as good an apparatus for allround work as can be found.

The "CORNEX" ROLL FILM HAND CAMERA.

1 plate Size.

Camera Body.—Machined mahogany, screwed to withstand the tropics, fine grained solid leather covering, rigid wood and metal base-board, nickelled fittings, rising front, leather handle, nickelled and frosted outside fittings specially designed to withstand wear. Spring open front.

Shutter—The B. & L. Gem Shutter, giving one instantaneous, also time and bulb, fitted to rising front with Rotating agence.

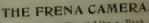
Rotating stops.

Finder-One rotating Cornex brilliant stationary type large size and very strongly made in solid metal case Arranged to fold up into the camera.

Changing Movement—On the daylight spool system with multiple pall system winder, allowing of accurate adjustment of the film with no back-lash, improved friction device.

PRICES.

Lens. Beck Symmetrical Isostigmar f 5.8 Isostigmar f 7.7	Gem Shutter£2 19 6 5 2 6 4 7 6	Celverex. 4 7 6 6 10 0 5 15 0	Unicum 3 12 5 15 5 0



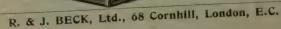
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The simplest of all cameras to us For certainty of giving good results henever been surpassed. Always in focu always ready.

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The Box Model camera has ne been equalled for producing the b space, but it takes really good photogra





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	•				F	ric	es.				
		1-p	late		5 ×	4	₹-E	late	e.	51×	31/2
		£	s. d	. £	s.	d.	£	s.	d.	£ s.	d.
With Beck Isostigmar, F/7.7 .		14 1	10 0	20	17	6	28	15	0	15	7 6
With Beck Isostigmar, F/5.8 .		15 1	10 (22	2	6	29	17	6	17 1	7 6
With Beck Isostigmar Lens, Series	1, F/4·5	18	0 0	25	17	0	36	10	0	22	5 0
New swing front, giving a large r movement, vertically and horizont			0 0	2	5	0	3	0	0	2	0 0
Beck Universal Telephoto attachmento above, Low Power			7 0	3	17	0	4	10	0	3 1	7 0

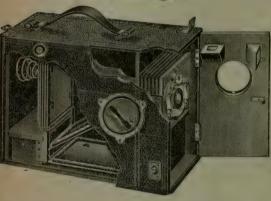


THE "CORNEX"

Twelve plates in sheaths, one motion changes the plate. For obtaining good results, not now and then, but always, use a good box model camera. This camera is fitted with good lenses, a good shutter, and has few adjustments. For hand cameras the fewer the adjustments the more certain the results.

Prices:

Fixed focus .. £1 1 0 and £2 2 0 Focusing model £3 3 0 to £6 12 6



THE 'DAI-CORNEX'

Daylight changing camera for plates. Loaded in daylight. Perfect reliability, quality first rate as in the Cornex. Good Box Model Cameras are always rigid, in focus, and ready for use; they do not get bent or strained, and when once right are always right. The daylight loading is a great advantage (see next page

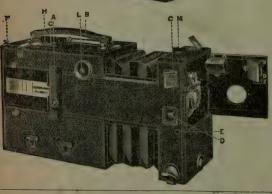
Prices:

Fixed Focus— £2 2 0 and £3 3 0 Fecussing Model— £4 4 0 to £7 2 6

THE TELEPHOTO "CORNEX."

A Magazine Camera for 12 plates, used in the ordinary way—can be extended and a Telephoto lens put into position at once, giving foci of 6 in. or 18 in. Full description of this unique camera is given in "Notes on Telephotography" (post free gratis).

Prices £12 12 0 to £21 15 0



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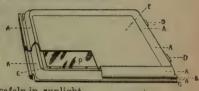
DAI-CORNEX CAMERA. THE

See previous page.

The Daylight Loading Camera for Plates .

The one essential difference between the Dai-cornex Cameras and all the rest of he "Box Model Magazine Hand Cameras" lies in the sheaths.

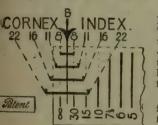
The whole sheath is slightly larger han the ordinary type, and is surounded by a v-shape ridge or groove unning completely round it. No light an pass in between the two sheaths on ecount of the ridge fitting into the roove, as this makes a most efficient ght trap. The whole pack of 13 heaths and 12 plates can be handled safely in sunlight.



The focussing Dai-Cornex, Cornex, Telephoto Cornex, and Roll Film Cornex nd Zambex cameras are fitted with the

PATENT CORNEX INDEX.

The special feature of this Index is that besides pointing out the distance at hich the object is in the most exact focus, it also gives the distances on either ide which will be in focus with the different apertures.



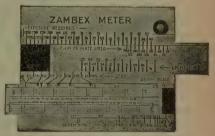
In the Figure the arrow (B) and the cross lines take the place of the usual pointer. The arrow B, if set to the scale, indicates the "sharpest plane" (in the Figure at about 40 ft.). The cross lines at right angles to this arrow indicate the distance sharp on both sides of this plane for the lens apertures f/8, f/11, f/16, f/22.

For larger apertures than f/8 f/5.8, f/4, etc., there is but little depth of focus.

ZAMBEX EXPOSURE METER.

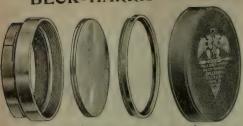
The New Zambex Meter embodies ome of the advantages of the fornex Index in that while it gives he exposure and stop to be used. also gives the depth of focus hat is obtained with the different pertures.

Full particulars are sent vith each meter, which is in the orm of a neatly finished pocket ook.



Price of Exposure Meter, complete, 1/6. Extra refills, per packet, 6d.

BECK-HARRIS SPECTRUM FILTER*



This Screen allows of the truest rendering of all colour values without in creasing the necessary exposure in the same proportion.

The result is obtained with an increase of exposure of but 4 to 5 times with a highly orthochromatize plate and gives a greater

differentiation than the ordinary yellow glass screen with 8 times the exposure.

QUALITY I.

No.	Size.	For Orthostigmat No.	PRICE.
1 2 3 4 5 6 7 8 9	1 in. 114 114 124 224 224 333	1, 0, 0a 2, 3, 4, 2a, 3a 5, 3b, 4a, 2b, 3b 6, 7, 8, 8a 9	£1 10 0 1 16 0 2 0 0 2 15 0 3 10 0 4 0 0 5 0 0 7 0 0 12 0 0

QUALITY II. For PRICE. Orthostigmat No. Size. 0 7 0 7 0 7 0 9 £0 lin. 1, 0, 0a 6666 2, 3, 4, 2a, 3a, 2b 5, 4a, 3b 6, 7, 8, 5a, 6b 0 9 0 11 0 13 0 14 0 17 4 678 9

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Notes on Telephotography

Photographer's Note Book on Lenses.

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PRICE—All Grades. Platino-Matt, Natural Surface (Smooth or Rough), Cream Crayon, and White or Pink Enamels.

SIZE.	Doz.	ı Doz.	SIZE.	₹ Doz.	ı Doz.
4 × 3 6 × 4 8 × 6 10 × 8 12 × 10 15 × 12 15 × 12 16 × 12 16 × 12 16 × 12 16 × 12 16 × 12 17 × 12 17 × 12 18	1/8 2/6	#d. 9d. 1/6 2/- 3/- 4/-	18 × 15 20 × 16 23 × 17 25 × 21 30 × 23 30 × 25	3/9 4/3 8/- 6/10 9/6 9/10	7/3 8/3 9/6 13/6 18/6 19/6

20ft. ROLLS, 25in. wide, 18/-; 30in. wide, 17/-; 40in. wide, 22/6; 53in. wide, 32/NOTE: ENAMELS in Rolls 25 inches wide only.

PLATINO-MATT. (Rough or Smooth). A beautiful perfectly Matt-surfaced Paper, with the deep rich, soft tones and pure whitesof a Platinotype.

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Gaslight Papers

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Each Packet also contains sufficient quantity of special Developer in concentrated tablet form.

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3 × 2 5	20 ,,	,,	0 6	64×43	12 p	93	1 0
32×32	16 ,,	12	0 6	73×5	10 ,,	19	1 0
34 × 34	14 11	21	0 6	8½×6½	I4 11	13	2 0
44 × 32	12 ,,	99	0 6	10×8	12 ,,	2.9	2 9
5 ×4	9 11	**	0 6	12×10	12 ,,	9.9	4 2
		BOXES	S (inclu	ding Develo	oper).		

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32×25	28 ,,	400	***	0 6		61×42	16 ,,	***	1	0
34×34	23 ,,	***		0 6		73×5	12 ,,		1	0
33×33	20 ,,	***	***	0 6		8½×6½	9 11	***]	0
44 × 34	18 ,,	***	***	0 6		Io×8	12 ,,	***	2	0
5 ×4	12 ,,	***	***	0 6	,	12 × 10	12 ,,	***	8	3 0

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No. 1 C.D. V. 35×28 No. 2 C.D.V. 34×21	s. d. 1 6	No. 1 Cabinet 5\(\frac{3}{2} \times 4 \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		0
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BROMIDE, Matt or Glossy. Per doz. 7d.; per gross, 6/-; per 1,000, 37/9.

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ENAMELS.

Vitrified Photographs Burnt into Enamelled Copper Plaques.

A very beautiful form of Miniature of great artistic value and absolute permanency, now established as a leading speciality in most high-class Photographic Businesses.

The image is formed of imperishable Ceramic colours, and is fired in the function of the enamel and give it a brilliant gem-like surface.

PRICES OF REAL ENAMELS

From Original Negatives (Copies One-third Extra.)

Rectangles	No. 3 2×18 2 diam	7×16	14×1	13×1	28×18 28×18	23 × 21 3 × 2		No 30 4×3 41×3
*Enamels in Monochrome Enamels Carefully	10/-	10/-	12/6	15/-	20/-	23/-	25/-	80/-
Painted Finished	31/6	31/6	40/-	50/-	60/-	80/-	90/-	120/-
Colours Finished	80/-	50/-	60/-	72/-	85/-	112/-	125/	180/-

^{*} Colours: Rich Brown, also Black or Bartolozzi Red to order.

Small enamels either in colours or Monochrome may be set with charming effect in a variety of Miniature and Jewellery Settings as Pendants, Brooches, Lockets or Watch Domes, &c., &c.

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TELEGRAMS: "ARGENTIC, RICHMOND, SURREY."

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Bromide Enlargements

On Platino Matt, Natural Surface, Cream Crayon, or White or Rose Enamel Paper.

The state of the s											
Size.	lack & White Enlargement unmounted.	Sepia Enlargement unmounted.	Mounted on card and potted extra.	Mounted on India Tint nounts extra.	BLACE	NISHING K AND V EXTRA.	VHITE	WAT OIL C	ING IN ER OR OLOURS	五元	
	Black Enlar	Enla	Mounte card a	Mount India mounts	3rd Class	2nd Class	rst Class	2nd Class	ıst Class	Framing in solid Oak J	
6½×4¾ 8½×6½ 10×8	-/6 1/0 1/4	-/8 1/2 1/8	-/2 -/3 -/4	-/4 -/6 -/10	1/3 1/6 2/0	3/0 4/0 5/0	8/0 8/0 10/0	3/6 7/0 10/0	7/0 14/0 20/0	2/6 3/2 4/6	
12 × 7½ 12 × 10 15 × 12 17 × 10½	1/6 1/6 2/0 2/0	2/0 2/0 2/6 2/6	-/4 -/4 -/6 -/6	-/10 -/10 1/2 1/4	3/0 3/0 4/0 4/0	6/0 6/0 8/0 8/0	12/0 12/0 12/0 12/0	10/0 10/0 14/0 14/0	20/0 20/0 27/0 27/0	8/0 8/0 8/10 5/10	
18 × 15 20 × 16 23 × 17 24 × 18	3/0 3/2 3/4 4/4	3/6 3/9 4/0 5/0	-/9 -/9 -/10 1/0	1/4 1/6 1/8 2/4	4/8 5/0 5/0 6/8	9/4 10/0 10/0 13/4	14/0 15/0 15/0 20/0	20/0 23/0 26/6 33/4	31/8 34/0 36/8 46/8	6/9 8/0 9/6 10/9	
24 × 20 30 × 22 30 × 25	4/4 6/8 8/4	5/0 8/0 10/0	1/0 1/2 1/8	2/4 2/8 3/4	6/8 8/4 10/0	13/4 16/8 20/0	20/0 25/0 30/0	33/4 36/8 40/0	46/8 86/8 66/8	10/9 11/8 12/6	
36 × 28 40 × 30 50 × 30 48 × 36	10/0 11/8 13/4 16/8	12/0 14/0 16/8 20/0	3/4 4/0 6/8 6/8	8/4	13/4 15/0 16/8 20/0	26/8 30/0 33/4 40/0	40/0 45/0 50/0 60/0	Special otation.	er Special Quotation	13/6 22/6 27/0 31/6	
60 × 30 60 × 40 96 × 50	16/8 23/4	20/0 28/0 84/0	10/0* 11/8* 20/8*		20/0 23/4 46/8	40/0 46/8	60/0 70/0 140/0	Per S Quot	Qu	59/6 75/6 133/6	

* Mounted on Canvas Stretcher.

TWI-TINT BROMIDES

TWI-TINT ENLARGEMENTS are **printed in two colours** the flesh in a delicate warm Sepia tone and the draperies and background in a rich black. The result is an eulargement in tints that only requires augmenting with a little hand colouring here and there to give the effect of a richly tinted water colour portrait. A large part of the colour effect is given by the two colour printings and this enables the artist to produce beautifully coloured Twi-Tints at the cost of black and white.

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Carbon Enlargements.

* In Standard Brown, Engraving Black, Sepia or Red Chalk.

Size (approximately).	nted	Case Class Clas			FINISHING IN MONOCHROME		
E	Extra	Moun Cardbo spottin Moun Indian	3rd Class	2nd Class	rst. Class	2nd Class	Class
\$\frac{1}{2} \times 6\frac{1}{2} \\ \times 6\	/8	-/2 -/4 -/3 -/6 -/6 -/4 -/10 -/4 -/10 -/6 1/2 -/6 1/2 -/6 1/2 -/9 1/4 -/9 1/4 -/9 1/4 -/9 2/4 1/0 2/4 1/2 2/8 3/4 8/4 4/0 6/8 6/8 6/8	1/3 1/6 2/0 3/0 3/0 4/0 4/8 5/0 5/0 6/8 8/4 10/0 16/8 20/0	3/0 4/0 5/0 6/0 6/0 8/0 8/0 10/0 10/0 13/4 16/8 20/6 33/4 40/0	6/0 8/0 16/0 12/0 12/0 12/0 12/0 15/0 15/0 20/0 20/0 25/0 40/0 45/0 50/0 60/0	Net Special (10,000)	Per Special 2017 1410 170

^{*} If no colour is specified Carbon Enlargements are printed in Standard Brown

Miniatures on Ivory Base.

(Carbon Process).

Size				No. 1.	No. 2. 28 X 134	No. 3. 28×17	No. 4	No. 5. $3\frac{1}{2} \times 2\frac{3}{4}$	No. 6.	No. 7.	No. 8. 5×4
	Plain Painted	din		2/-	2/4	3/-	3/4	4/-	4/4	4/8	6/-
	er Colou ully Fin			14/-	17/6	21/-	28/-	28/-	42/-	42/-	56/-
Highl	y Finish	ned	•••	28/-	35/-	42/	66/8	66/8	98/-	38/-	112/-

When a negative is sent from which an enlarged or reduced print has to be made the extra cost will be 2/8.

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Crown 20x15	145×115	3 8 6	5 1 0	6 11 0	9 11 0	16 11 0	34 11 0	1 12 0
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Royal 25x20	18×15	4 7 0		9 16 6			50 16 6	
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250	Prints	(trimmed fo	r mounting)	38/6	60/-	88/-	£6
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"MIDG" Magazine Cameras.



The striking value of this series of Cameras is now admitted throughout the whole world. They are suitable for all countries. No similar series of cameras offers such excellent value for money.

No.	Size.	Focussing. Shutter.		Lens.	Price.			
0	1-pl.	Magnifiers	Everset 1 to 100 sec.	R.R.	£1 1 0			
0	P.C.	Magnifiers	Everset I to 100 sec.	R.R.	1 15 0			
'00	₹-pl.	Magnifiers	Everset 1 to 100 sec.	Beck R.R.	1 5 0			
ra ·	1.pl.	Rack focussing	Everset I to 100 sec.	Beck R.R.	1 11 6			
1	₹-pl.	Lever focussing	Simple Automatic	Beck Symm.	2 2 0			
I	P.C.	Lever focussing	Simple Automatic	Beck Symm.	2 10 0			
3	1-pl	Rack focussing	Primus Automatic	Beck Symm.	3 0 0			
3	P.C.	Rack focussing	Primus Automatic	Beck Symm.	3 10 0			
4	1 -pl.	De Luxe Finish	Primus Automatic	Beck Symm.	3 10 0			

The Horizontal No. 4. is supplied with Aldis, Ross, Cooke and Goerz Lenses.

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Camera Works Blackheath

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The Acto-Midg.

The Camera that tells you what exposure is necessary.

The "Acto-Midg" is the latest advance in hand camera construction, and with it is combined a light meter working in conjunction with the shutter, giving the correct speed under all conditions of lighting.

Prices complete for 12 \frac{1}{2}-plates— Fitted with single Achro Lens, working at F/11 £2 2 0

Fitted with Uno Aldis
Anastigmat Lens,
working at F/77 3 3 0

The Miniature Selfix.



A waistcoat pocket camera for pictures on plates $2\frac{5}{16} \times 1\frac{3}{4}$.

A dainty little camera, measuring when closed $3\frac{1}{4} \times 2\frac{1}{2} \times 1\frac{1}{8}$. Fitted with a front, which on pulling down the baseboard comes out and locks itself in position ready focussed.

With single Achro Lens, F/11 £2 2 0

With Rapid Aplanat,
F/8............ 2 12 0
With Goerz Dagor,

F/6·8 7 0 0

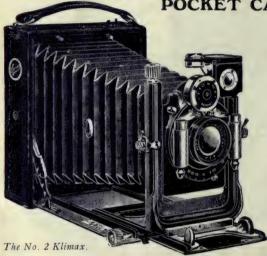
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"KLIMAX" FOLDING POCKET CAMERAS.



One of the special 'Klimax' features is the extreme rigidity of the front. It is of remarkable strength and when in position is absolutely steady. Rising and cross movements are provided. The rise being actuated by a quick thread screw. The camera is made

of mahogany and the back can be swung both ways and locked at any angle. The lens is the new Aldis "Uno" Anastigmat f/7.7—covering the plate well at open aperture—set in an Automat Shutter. Focussing is by rack and pinion.

Size.	Lens.			del N Ext	Model No. 2. Double Extension.				
1-plate	Aldis	"Uno"	Anastigmat		15		£4	7	6
5×4	77	2.2	22		15	U	5	7	D
Post-card	,,	9.9	99	4	15	0	5	7	6
-plate	,,	22	,,	5	15	0	6	7	6

Also fitted with Primar, Aldis, Cooke, Dallmeyer, Goerz & Ross Lenses.

Extra Dark Slides .. 1-pl. 1/6 5×4, 2/0 Post-card, 2/0 1-pl., 2/6

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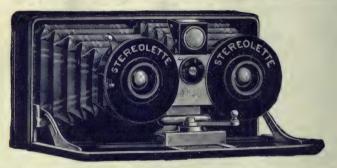


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A dainty Camera taking Stereoscopic picture 41 × 12 (45 × 107 c/m).



An exquisitely finished camera taking Stereoscopic pictures. It is made of metal, leather-covered, has a rising front and is rack and pinion focussing. The shutter is an everset automatic. A hooded focussing screen and two slides are supplied.

With a pair of Rapid Aplanat Lenses f/8	£3	10	0
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For printing glass transparencies from Stereolette negatives.

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For making glass transparencies in one printing without transposing.

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The "Primus" Stereoscopic Printing Gauge.

For printing Stereolette negatives on to post-cards.
PRICE, Gauge & Masks, 1/3

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The STEREO-CAMEO FOLDING CAMERAS. Standard size 62×37.



This series of cameras have every movement the stereoscopic photographer requires. Wellmade, they fold

into a very small space, and can be carried in an ordinary jacket pocket.

	Single Achromatic Lenses and Simplex Shutter	£2	15	0
	Beck Symmetrical Lenses and Automatic Shutter,			
	Beck Symmetrical Lenses and Primus Shutter, 1 to	5	0	0,
No. 2.	Beck Symmetrical Lenses and Primus Shutter, 1 to			
	100 sec			

The "Primus" Stereoscopic Post-card Printing Gauge (Registered).



This gauge enables stereoscopic negatives to be printed with the greatest ease and accuracy on sensitized post-cards. With each gauge a supply of masks are supplied, as well as complete instructions for making.

Gauge and Mask.

					PRI	CES.	(Gauge an Mask.		with ‡-plate rinting Frame and Glass.	
No.	I.	For	Stereolett	e size	negativ	es (41×	13)	1/3	 	2/6	
No.	2.	2.0	Post-card	,,	,,	(51×	31)	1/3	 	2/6	
No.	3.	,,	Standard	2.3	11	$(6\frac{3}{4} \times$	31)	1/6	 	2/9	
0		44.074		F31 -4		M 4		46	 		

Booklet "Stereoscopic Pictures and How to make them" free on application,

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The "Carbines" are the most completely equipped roll film cameras on the market This design is most carefully thought out and they have many features of practical use not found on other instruments. Designed primarily for roll films, they are so constructed that plates can also be used. They are provided with every movement of practical use.

No.	Size.	Extension.	Shutter.	Lens.	Price.
2 2 3a 3a 3b 3b 4 4	1-pl. P.C. 1-pl. P.C. 1-pl. P.C. 1-pl. 1-pl.	Single Single Single Single Single Single Single, rack focussing Single, rack focussing Double, rack focussing	Simple Automatic Simple Automatic Simple Automatic Simple Automatic B. & L. Automat B. & L. Automat Primus Automatic Primus Automatic Primus Antomatic	Beck R.R. Beck Symm.	£2 5 0 3 3 0 0 2 12 6 3 10 0 3 12 6 4 12 6 6 6 0 4 10 0

Also with Aldis, Cooke, Goerz, Dallmeyer and Ross Lenses.

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The "Pressman - Reflex."



Focal Plane.

Is in every respect an instrument of the higher order. It is remarkably free from unnecessary complications, but at the same time has every movement necessary for rapid and reliable working. The shutter is of the permanent slit variety, i.e.-with fixed apertures, and the desired opening can be instantly brought into position. The rotating back works in conjunction with a revolving mask under the focussing screen, showing the exact horizontal or vertical picture. The camera is made in the best possible manner and is not affected by climatic influences.

Price List.

‡-plate Camera and 6 Single Metal Slides. 5×4 Camera and 3 Double Mahogany Slides.

Lens.	₫-plate.	5×4
Camera and Slides only . Aldis Uno Anastigmat, $f/7^{\circ}7$. Cooke Lens, Series III., $f/6^{\circ}5$. Ross Zeiss Tessar, Series IIB., $f/6^{\circ}3$. Goerz, Series IB., $f/4^{\circ}8$. Goerz, Series III., $f/6^{\circ}8$.	£9 9 0 10 14 0 14 6 0 15 0 0 15 19 0 15 14 0	£14 14 0 20 17 0 23 4 0 23 19 0 23 9 0

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The "NATIONAL" FIELD CAMERA OUTFITS.



This range of outfits is made throughout in the best possible manner, with substantial brass fittings. Every necessary movement is provided. Swing and reversing back, wideangle movement and swing and rising front, roller blind shutters with time valves, giving a range of exposures from 1 to 3 secs., the whole forming outfits of a most serviceable type at a remarkably low cost. Models in teak are now made, which will be greatly appreciated by those living in tropical climates.

No.	Size.	Extension, etc.	Extension, etc. Shutter.			Price.		
4	1 -pl.	Double, revolving back	Swift R.B.	Beck Symm.	£2	17	6	
4	a-pl.	Triple, revolving back	Swift R.B.	Beck Symm.	3	15	0	
4	}-pl.	Triple, revolving back	Swift R.B.	Beck Symm	5	17	6	
4 8	₹-pl.	Teak, triple	Swift R.B.	Beck Symm.	4	15	0	
8	-pl.	Teak, triple	Swift R.B.	Beck Symm.	7	7	6	
9	-pl	Teak, brass-bound	Swift R.B.	Beck Symm.		15	0	
9	i-pl.	Teak, brass-bound	Swift R.B.	Beck Symm.		12	6	
5	-pl.	Triple, brass-bound	Swift R.B.	Beck Symm.		15	0	
5	i-pl.	Triple, brass-bound	Swift R.B.	Beck Symm.	7	2	6	
5		Double, brass-bound	Swift R.B.	Rapid Rectil	10	0	0	
		Double, brass-bound	Swift R.B.	Rapid Rectil.	11	10	0	
		Double, brass-bound	Swift R.B.	Rapid Rectil.			0	

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Camera Works: Blackheath.

SUPPLIED

Butcher's

POST-CARD PRINTER.

The "Klimax" Post-card Printers.

(Patent applied for.)



The 'Klimax' Post-Card Frame.

Can be used in the hand and exposed to the gas flame in the usual manner, or it can be screwed down to a table or box, with a hole in it and exposures made by means of the

This Frame overcomes the following difficulties:-

- 1. Of easily selecting the best portion of Negative.
- Of holding the Negative and Mask securely. Of printing Post-Cards from smaller negatives.
- Of printing a small piece from a large negative.
- Of printing with a very thin white margin.
- Of combination printing.

PRICES.

Frame, including 1-plate and -plate Negative Carriers and three Masking Gauges (1-plate, Post-card and a-plate)



The 'Klimax' Printing Boxes.

Made of polished mahogany, and fitted with a patent 'Klimax' Printing Frame. The burner is fitted with a most ingenious bye-pass, and the act of bringing down the pressure board of the frame automatically gives the full supply of light. On releasing the pressure the light is cut off again.

For electric light .. £1 5 0 For incandescent gas 1 10 0

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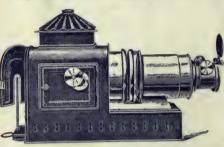
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Optical Lanterns.

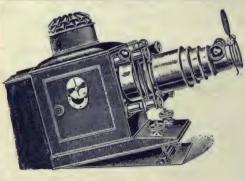
We make a very large and well assorted range of lanterns, particulars will be found in our booklet "Optical Lanterns and how to use them;" we nvite you to write for a copy of this list.



The "Council."

is a first-rate lantern made of Russian Iron, with extra heavy brass front and draw-tubes. It has a 4" plano-convex condenser, a 2" diameter lens and a Russian Iron carrying case, Its great point—the maximum value at the minimum price.

			price.			
No	. Iod.	Fitted with	tray and cowl	£2	14	0
99	IO	7.7	3-wick lamp	2	16	0
99	Ioa	9.9	4-wick lamp			
	IOC .	***	incandescent burner, support and reflector			
	roe	"	Stocks' pattern lamp			
99	rosl	99	No. o Meta spirit lamp	3	2	6



The "Iron Duke" No. 18 Combined Projection Lantern and Stage Arc.

A well-constructed lantern of large size for use with arc lamps. It has a 5" condenser, and the front, which is of heavy build, is detachable, enabling the lantern to be used as a stage arc.

Fitted v	with 2-in cylinder lenses	£9 (0 0
Fitted v	with 2\frac{3}{2}-in. cylinder lenses	9 12	2 0

W. BUTCHER & SONS I

Camera Works: Blackheath.

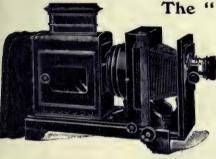
SUPPLIE

IS LANTERNS

Enlarging Lanterns.

We are the leading manufacturers of enlarging apparatus, making a range of over 20 patterns of daylight and artificial light enlargers. Our handbook, "How Can I Enlarge?" contains full particulars of these and will be sent free on application.

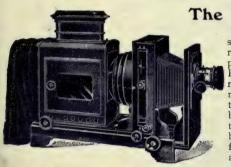
The "Abbeydale."



An enlarger of original and practical design. Its principal feature is the Central swing carrier stage operated by a rack and pinion. Another noticeable point is the large roomy lantern body with collapsible back curtain. The woodwork is of polished oak.

					1-plate.	
biective					£3 5 0	

5 ×	4 or	Pos	t-card.	3	-plate	e.
	£4	0	0	£5	15	0
	5	0	0	7	0	0



The "Record."

The feature of this instrument is the separate rack and pinion systems provided to all movements. It has a carrier that swings, rises and tilts, actuated by racks, and rack adjustment to lantern body and lens board. It is made of selected walnut in an unusually heavy manner, and is the finest enlarger obtainable at the price.

	1-1	late		5×4 or	Pos	st-card	. 1	-plat	e.	1-1	plate	à.
Objective	 £4	15	0	£5	15	0	£7	15	0	£13	5	0
1	-	4.00	•	-	-		-	40		40	-	-

With Objective 5 15 0 7 0 0 9 10 0 18 0 0

rringdon Av., London, E.C.

RAPHIC DEALERS.

Without

With Objective

Photo Mount Works: Copenhagen St.

140

Butcher's PORTABLE ILLUMINANTS.

The instruments illustrated herewith provide a simple means of obtaining a first-rate light at low cost and with the minimum of trouble.

The "KLIMAX" Acetylene Generator.



This Generator has the great advantage of portability, packing into a small box for carrying. It gives a very fine light equal to 150 candlepower, and when once started requires little or no attention. Owing to its construction it is easily cleaned. Lump carbide is used, and one pound will supply light for four burners for two hours.

Price .. £2 0 0

The "META" High-Pressure Spirit Lamp.



As an illuminant this lamp is second only to the oxy-hydrogen light. At a small cost an intense light, equal to 150 candle-power is obtained from methylated spirit. It is most simple to use, and is free from smell and smoke.

No. o. As illustrated, made in polished brass..... 10/6

No. 1. A lamp of superior make and finish 15/0

No. 1a. Similar to the No. 1, but holding 12 oz. spirit 18/0

W. BUTCHER & SONS L

Camera Works: Blackheath, S.E.

SUPPLIED

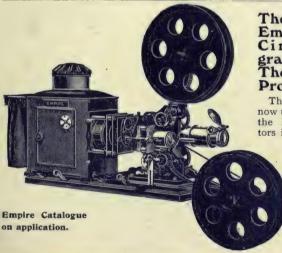
The "Empire" Cinematographs.



The No. 00
Empire
Combination
Cinematograph
and Projection
Lantern.

A first-rate living picture machine for home use, schools, bazaars, etc. It is an exact reproduction on a small scale of a regular machine for exhibition work. Ittakes the standard size films and can also be used as a magic lantern.

Complete, with cinematograph and lantern lenses, £5 15 0



The No. 2
Empire
Cinematograph.
The Theatre
Projector.

This machine is now used by most of the leading exhibitors in the country.

> It embodies many novel features, principal among which is the new safety cut-off.

> > Price £35

arringdon Av., London, E.C.

TOGRAPHIC DEALERS.

Photo Mount Works: Copenhagen St.

T. E. B. British Made Photo Mounts.

¶ We specially draw the attention of users of Photo Mounts to our unique facilities for their manufacture.



We have an immense range of patterns and styles, all our own exclusive design, suitable for every trade requirement. We can always deliver from stock.

¶ Professional Photographers are invited to write for samples, and compare our prices and quality with other makers. Remember our Mounts are all British made.

W. Butcher & Sons Ltd.

Camera House, Farringdon Avenue, London, E.C.

Mount Factory: King Cross, N.

MARION'S DRY PLATES.

Factory: Southgate, Middlesex.

EXCELLENT OUALITY.

UNIFORMITY OF SPEED.
FINENESS OF GRAIN.

EASY TO USE.

H. & D. Speed.	10.1		
ORDINARY 50 For General	and Outdo	or Gro	oups.
PORTRAIT AND LANDSCAPE 100 For Studio at	nd Landsc	ape w	ork.
INSTANTANEOUS 200 For Studio, 6 Hand-Ca	Children's amera wor	Portr k.	aits a
P.S 200 For exposure only can	es where a be given.		um tir

()	ACADEMY			(50) 100) 200)	Thickly-coated, trasts.	giving	strong	con-
-----	---------	--	--	--------------------------	----------------------------	--------	--------	------

SUPREME .. . 250 Extra thickly coated. Extreme Speed.

MARION-ISO .. 250 Extra speed. Accurately rendering colour values.

LANTERN .. — SLOW AND QUICK. For best Lantern Slides.

PROCESS .. - Specially suitable for all kinds of Line-Work, Collotype, etc.

Flat Films Coated with any of above Emulsions.

NOTE.—Please test our Manufacture for SPEED before deciding by actual camera exposures, and it will be found that

MARION'S PLATES ARE UNEQUALLED FOR QUALITY AND SPEED.

MARION'S TROPICAL PLATE (H. & D. 250.)

For Photographers Abroad, Travellers, Scientific Expeditions, etc., etc.

Thickly coated, specially prepared, specially packed. Will keep in any climate. Strongly recommended.

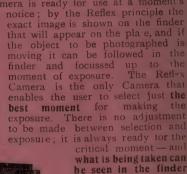
Write for the Booklet of Marion's Dry Plates, post free.

HAND CAMERAS.

The SOHO REFLEX Hand Camera.

The SOHO REFLEX is the Best Re le Hand Camera for Travellers Motorists, Artists, Press Correspondents, Naturalists, and all Photographe

who require in a Camera reliability, ease in working, and certainty of the best results. Every detail has been carefully studied with a view to eliminating all complications, while retaining all useful and practical advantages. The Camera is ready for use at a moment's



what is being taken can he seen in the finder all the time exactly as it will appear in the finished print.

Photographers we the Soho Reflex graphing of local events, sports, races, bazaars,

etc., etc., are a source of profit, and can only be efficiently done with a Reflex Camera. There is, further, a large and profitable field for the use of this Camera in At Homes, portrait work, and also in photographing children at home or in the studio. The half-plate is the most suitable size, and has an expension allowing of the fitting lenses up to 16 in. and 17 in. focus. With a large aperture lens and a quick plate, indoor snapshot work becomes a possibility. We are at all times willing to make any possible modifications to facilitate this special use of the Camera. 1 2

The SOHO REFLEX Hand Camera—(Contd.)

PRICE LIST.

	Po-t-card 5½×3½.*	1-plate.	5×4.	15-plate.
The "Soho" Focal Plane Reflex Hand	f. s. d.	f. s. d.	£ s. d.	f. s. d.
Camera as specification without lens,	± 5. u.	£ 5. u.	£ 36 U.	£ 8. U.
including 3 double block-form backs	12 10 0	12 0 0	18 0 0	24 10 0
If fitted with Goerz Syntor Anastigmat				
f/6.8, 6" focus; 2-plate, 8"				
focus	16 5 0	15 15 0	21 15 0	30 15 0
,, Cooke Lens Series III., 1/6.5,				
5½" focus; 5×4, 6" focus; ½-plate, 8½" focus				
g-plate, 84" focus	17 0 0	16 5 0	22 10 0	31 10 0
Ross Homocentric C, f/6'3, 52'				
focus; 5×4, 6" focus, ½ plate, 8½" focus	17 0 0	18 5 0	22 10 0	31 10 0
Coory Double Annetigment III	17 0 0	10 0 0	22 10 0	31 10 0
f/6.8, 6" focus; 5×4, 6"				
tocus; ½-plate, 8½" focus	18 15 0	18 5 0	24 - 5 0	33 5 0
,; Dallmeyer Stigmatic II., f/6,				
5'3 focus; 5×4, 6'4 focus;				
½-plate, 9" focus	19 5 0	17 15 0	24 15 0	35 0 0
,, Goerz Double Anastigmat I.,				
Series IB, f/4.8, \frac{1}{4}-plate,				
6" focus; 5×4, 6" focus;				
½-plate, 8½" focus	19 0 0	18 10 0	24 10 0	33 15 0
½-plate, 6" focus; 5×4, 7" focus; ½-plate, 8½" focus:	20 10 0	18 10 0	26 0 0	34 10 0
Solid Leather Cases, lined, lock and	20 10 0	10 10 0	20 0 0	34 10 0
key, with handle and sling strap to				
hold Camera and 6 backs	1 7 0	1 6 0	1 12 0	2 0 0
Solid Leather Cases, lined, lock and				
key, with handle and sling strap to	,			
hold Camera and 3 backs	1 2 0	1 0 0	1 8 6	1 14 0
Extra Double Backs, block-form	0 10 0	0 7 0	0 10 0	0 15 0
book-form, best qual.	0 15 0	0 12 6	0 15 0	1 0 0
"Soho" Focussing Magnifier	0 10 0	0 10 0	0 10 0	0 10 0
"Soho" Changing Box	2 0 0	1 15 0	2 0 0	2 10 0
M-ckenzie-Wishart Daylight Slide.	0 10 0	0 15 0	0 18 0	1 3 0
fitted	1 0 0	0 16 6	1 0 0	1 3 6
Envelopes for ditto	0 1 6	0 1 3	0 1 6	0 2 0
New Swing-Front, giving a large range				
of movement vertically and horizon-				
tally (to order)	2 0 0	1 10 0	2 5 0	3 0 0
Specially selected 3-fold sliding leg				1
Tripod, cloth-covered top	0 15 0	0 15 0	0 15 0	0 15 0
Antinous Release, specially fitted	0 7 6	0 7 6	0 7 8	0 7 6
Isochromatic Screens, in metal mounts				
fitting into hoods of lenses, yellow, 2, 4 and 8 times	From	18/8 noved		
Right-angled Mirrors, for fitting on	From	10/6 upwd.		
Front Lens, for taking views at right				
angles	0 15 0	0 15 0	0 15 0	1 0 0
Soho Viewing Mirror Attachment	0 13 6	0 12 6	0 14 6	0 16 6
Extra Lens Panels	0 3 0	0 2 0	0 2 6	0 3 6

^{*} In all cases the Post-card size is listed with lens of the same focus as 5 × 4.

THE TROPICAL "SOHO" REFLEX CAMERA.

This Camera, whilst retaining all the chief characteristic features of the ordinary type, which has attained such a marked and well-deserved reputation, has been designed and constructed to withstand the severely trying conditions experienced in Tropical Countries.

It is made of selected Teak, known to be well seasoned, strengthened and bound with brass where necessary, and polished. The hood and bellows are of best Russia leather.

The Dark Slides, too, are made of the same teak and brass-bound, in both the Block-form and the Book-form patterns.

We have every confidence in recommending this outfit for the use of Officers, Scientists and Experts in the most trying parts of the world.

PRICE LIST.

The "Soho" Focal Plane Reflex Hand Camera, as specification,	a			
		£ s. d.	£ s. d.	£ s. d.
without lens, including 3 double block-form backs 18 10	. 0	17 17 0	26 10 0	36 0 0
Goerz Syntor Anastigmat f/6·8, 6" focus: ½-plate 8½" focus	0	21 12 0	30 5 0	42 5 0
focus; 5×4, 6" focus; ½-plate, 8\frac{1}{2}" focus. Ross Homocentric C, f/6'3, 5\frac{1}{2}" focus; 5×4, 6" focus; \frac{1}{2}-plate, 8\frac{1}{2}"	0	22 2 6	31 0 0	42 0 0
	0	22 2 0	31 0 0	43 0 0
\$-p-ate, 8½" focus	0	24 2 0	32 15 0	44 15 0
9" focus	0	23 12 0		
focus; ½-plate, 8½" focus	0	24 7 0		
8½" fccus	0	24 7 0 0 9 6 0 18 0	0 14 0	46 0 0 1 1 0 1 10 0
pattern 3 0	0	2 12 6 1 1 0		3 15 0 2 0 0

^{*} In all cases the Post card size is lister with lens of the same focus as 5 x 4.

For Price List of other extras, see page 145.



A NEW INTRODUCTION.

The 'Dainty' Reflex.

For Plates and Film Packs. $3\frac{1}{6} \times 2\frac{1}{6}$ inches.

One Third Actual Size.

This beautiful little instrument removes the only objection that can be urged against the Reflex type of camera—that of size. It is light, small and compact, beautifully finished, of the highest efficiency, with all movements and fittings for turning out the highest class of work—a veritable camera-de-luxe. Ladies, travellers, cyclists, motorists, all those to whom a small size is a desideratum, will find this camera all that can be desired, retaining as it does all the advantages of the Reflex system. The pictures obtained are capable of enlargement to any desired size, if required—the whole outfit being of a quality that ensures sharp, crisp, perfect negatives. The adjustments are simple, and the camera can be used with dark slides, changing box or film pack adapter. A magnifier is fitted in the hood to assist in focussing. ZEEF Full details on application.

111001			
The Dainty Reflex, with 3 double block-form blocks, complete, without lens	£10	0	0
Ritted with Zeiss Tessar Lens, F/4.5, focus 4½ in		0	•
Block-Form Double Backseach	. 0	7	0
Book-Form Double Backseach	0	12	6.
The Soho Changing Box, carrying 12 plates or 24 cut films	1	15	0
The Soho Film Pack Adapter	0	12	6
Solid Leather Case for camera and 3 backs, or camera			÷-;
and! changing box	0	15	0

"Sono" Stereoscopic Reflex Camera



Many will appreciate this addition to the range of Reflex Cameras; giving the user all the advantages of a Stereoscopic Camera without in any way interfering with its use, with a single lens in the ordinary way. The charm and reality of many a "Reflex" picture will be enhanced greatly by being taken and reality and the stereoscopic and the ste

We fit to the $5\frac{1}{2} \times 3\frac{1}{2}$ Reflex special removable screens and divisions permitting the use of two paired lenses. mirror, while it can be removed in a moment when desired.

PRICES:

two paired lenses .. £14 10 0

f 6'8, paired 5in. focus. . £25 8 0

N.B.—Owing to the small space available and the great variation in sizes of lenses, we cannot guarantee to fit pairs of all makes of lenses.

The "Soho" Viewing Mirror Attachment

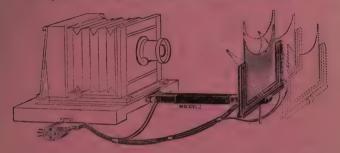
This novel and ingenious fitting enables the user to hold the Camera at eye level, or even at arm's length above the head. When holding the Camera in the ordinary way, looking down into the hood, it often happens that this position necessitates the inclusion of an unnecessary amount of loreground and that sometimes (for instance in a crowd) the taking of a picture is impossible. The Viewing Mirror abolishes this drawback. It slips instantly on the lid of the Camera, the mirror being hinged so that it can be adjusted for any required height. It folds flat for putting away in the Camera Case. Covered leather.

PRICE:

Post-card, 13/6. 1-plate, 12/6. 1-plate, 16/6. 5 × 4, 14/6.

GOOD'S PATENT VIGNETTER.

(MARION & CO., LTD., Sole Makers.)



OOD'S VIGNETTER, thes invention of an experienced operator, is the last word in Vignetters for the front of Lens, and is easily superior to any other in range of movement and ease of working. It is an ingenious application of Bowden Wire Mechanism, very simple and at the same time so strong that there is no likelihood of any derangement. An outstanding feature of Good's Vignetter is the ease with which it can be fitted to any Camera or Stand; three screws to put in and the Vignetter is fixed, while it can be instantly removed if not required. It has complete range of movements in four directions—(1), distance from Lens; (2), lateral movement; (3), upward movement; (4), swing in both directions. All movements are under complete control of the operator while focussing, by means of the control box and levers. The movements are all of wide range, gradual, and accurate. The lateral movement is useful and a new one in Vignetters. The axis of the swing movement is in line with the base of curve in serrated screen; thus when the swing is used no further adjustment in height or distance from Lens is necessary.

Good's Vignetter is simple in working, most reliable, light and compact. It is sent out securely packed in strong cardbox box. To save space, the arm is divided; the user has only to screw the brass plates which are fitted ready, for which screws and the holes drilled are provided. The socket carrying the Vignetter is fixed by means of one screw to front of Camera or Stand. The control, with levers, is fixed by means of two screws and keyhole slots to the side of Camera or Stand in the position most convenient to the user.

Price of Good's Vignetter complete as described, 45/-

The Boardman "Northlight" Arc Lamp

With Collapsible Reflector Stand.

This Lamp can be easily moved about the Studio, and the Reflector can be moved to any desired angle.

The whole apparatus can be taken apart in a few minutes. Cost of transit is thus lessened, and the use of the Lamp at Halls, At Homes, etc., is facilitated.

The Boardman Lamp is actually economical in use. It is relatively more economical when compared with other lamps, as the greater part of the current used is light producing. No complicated mechanism to get out of order, the feed of the Carbons being done in a fraction of a second by a touch of the hand.

The normal height is 8 ft. to the top rim of Reflector, but the Stand can be raised so that the extreme height to top rim is 11 to 12 ft.

REFLECTED RAYS ONLY ARE USED.

PRICE LIST. BOARDMAN'S MULTI-CARBON ARC LAMPS, etc.

Number of Arcs in Series.	Two Pair,	Three Pair, 150 Volts.	Four Pair, 200 to 230 Volts.	Five Pair, 230 to 250 Volts.
Hand-Feed Lamp Auto-Feed Lamp Collapsible Reflector	£ s. d. 4 4 0 5 10 0	£ s. d. 6 6 0 7 10 0	£ s. d. 7 7 0 8 10 0	£ s. d. 8 8 0 9 10 0
and Stand Collapsible Reflec-	8 10 0	8 10 0	8 10 0	8 10 0
tor; to hang with- out Stand	3 15 0	3 15 0	3 15 0	3 15 0

Resistances.	Curi Sup 100 V			200 .ts _t	Up to Vol	
Plain Resistance, to fix on wall where light is not regulated Type A Regulating Resistance, to fix on wall. Radial Switch and Fuse. For varying power of light, according to	35	d. 0	5. 55	d. 0	60 60	d. 0
requirements Type B	95	0	105	0	110	0
Portable Regulating Resistance, with D.P. Switch and Fuses	135	0	150	0	170	0

As an example, we give below cost of a complete Outfit for a 200-Volt Current Supply. On this supply the Four-pair Carbon Lamp is the most economical, though Two- or Three-pair Carbon Lamps can also be fitted:—

Four-pair Carbon Lamp, Hand Feed . . . £7 7 0 Collapsible Reflector and Stand 8 10 Ulain Resistance 2 15 0

£18 12 0

Or with Hanging Collapsible Reflector instead of Stand, £13 17 0

MARION'S Electrical Department.

ANY Electrical Work undertaken. Estimates free.

Besides the Boardman Multi-Carbon Arc Lamps, already referred to, we can supply—

THE WESTMINSTER ENCLOSED ARCS, COOPER-HEWITT MERCURY VAPOUR LAMPS, etc., etc.

Write for ELECTRICAL DEPARTMENT BOOKLET, post free.

The "HANA" STUDIO STAND.

PATENT No. 2491.

As will be seen from this illustration, this Studio Stand is novel in design and appearance. It is a complete departure from the ordinary Studio Stand, and embodies features that have long been desired by Photographers.

We claim the following advantages:



Rapid working, with great ease and accuracy. The raising and lowering of the table carrying the Camera is done with a touch, instantly—one little movement with a lever and it is clamped firm at once in the desired position. Tilting is done in the same way—a lever released and the Camera tilted up or down instantly. These two levers control all movements; one secures rigidity at any height and the other the angle of tilt. There is no winding up, no screws or racks, no effort required.

Large range of movement.—The Camera may be placed from 2 feet off the floor to 7 feet high and altered to any intermediate position instantly; every Photographer will appreciate the value of being able to immediately put the Camera as low as two feet from the floor, to photograph children and animals with natural effect. Further, there are advantages in the use of the Camera high up that are not fully realised by all operators. Bust pictures of stout sitters are best taken with the sitter standing and the Camera level with the head—this is not possible with the majority of Stands. For groups of three or more

rows of persons the Camera can be placed about seven feet high; this brings the view point near the centre of the group, allowing a large stop to be used, giving a better view of the back rows and a more pleasing and successful result.

The Stand is very strongly made; the uprights are metal with balances in each tube. The base is of polished or ebonised finish, having partition for Dark Slides, and being on Castors, allows of the Stand being easily moved at will. The Stand will carry ordinary 1/1 pl., 10×8 or 12×10 Studio Cameras. A larger size is in preparation.

Price - - £8 0s. 0d.

The "ROBINSON" Professional Retouching Desk.



THIS Retouching Desk, devised by Mr. W. R. Robinson for practical use in his own studio, meets the needs of the Retoucher in a perfect fashion. The illuminant is two Metal Filament Electric Lamps working in series, at an infinitesimal cost. It provides a perfectly even and ample light at all times, fully lighting up the part of negative under operation without any inconvenience to the eyes of the retoucher. The lamps are provided with an adapter, which will fit into any ordinary Electric Lamp fitting. The interior is coated a matt white, the door at the back being adjustable to suit any degree of reflection. The negative carrier is also adjustable and will take any negative from 12 × 10 size downwards. The whole is strongly made and neatly finished in stained and polished wood. Every Photographer will find this Desk invaluable.

Price complete, including Two Metal Filament Lamps and Fittings, with Flex and Adapter, as illustrated,

65/-

MARION'S MOUNTS.

BROWN MOUNTS with gold bronze line and gold flat edges.

No.	Size of Mour	nt				Chickne	ess.	Per 100	1000	
2070	ro×8 with	gold	bronze line	$6\frac{1}{2} \times 4\frac{3}{4}$	square	No.	15	16/-	144/-	
2073	5\\ × 5\\ 4	11	11	33 inc	h circle		15	8/-	72/-	
2074	7 ×7		.,	48			15	13/-	117/-	

STICKY=BACK MOUNT. (For oval post-card.)

Ivory white, with oval design delicately printed in gray, and oval opening.

No.	Size of Mount	I nickness.	Per 100	1000
2085	$6\frac{7}{8} \times 4\frac{7}{8}$ with oval opening $4\frac{9}{16} \times 2\frac{15}{16}$.	. No. 9	5/4	48/-

CABINET PROMENADE.

Fine white plate-paper surface with embossed double line plate mark.

No.	Size of Mount		Thickness.	Per 100	1000
2120	10 × 6 with embossed p	ate mark 61 × 3	No. 18	8/-	72/-

LIMP MOUNTS "COSWAY" DESIGN.

Brown, with design in darker shade printed out to edge. Plain edges.

No.	Size of Mount		Thickness.	Per 100	1000
2171	$10 \times 7^{3}_{4}$ with	centre $6\frac{1}{4} \times 4\frac{1}{4}$ square	No. 9	6/8	60/-
2173	10 × 8	, $5 \times 3\frac{9}{16}$ oval	,, 9.	6/8	60/-
2175	10 × 8	, $4\frac{1}{4}$ inch circle	,, 9	6/8	60/-

THE "WILTON." (For Cabinet.)

Matt Cream with choice design in very pale sepia.

No.	Size of Mount	Size of centre.	Thickness. Per 100	1000
2177	II × 8g with	design $5\frac{3}{4} \times 4$	No. 10 13/4	120/-

Usual terms to the Trade, to whom samples and full lists will be sent on application.

MARION'S MOUNTS.

THE "TROUVILLE." (For Cabinets.)

Cambric surface in two shades of grey, with border and centre in darker shade. Coloured bevelled edges.

No. Size of Mount.

Thickness, Per 100 1000 2180 II \times 8 silver-gray with darker centre 6 \times 48 square No. 15 21/- 189/-

2181 II × 8 slate-gray with darker centre

 $6 \times 4\frac{1}{8}$ square No. 15 21/- 189 - 2186 11 \times 8 silver-gray with darker centre

 $5\frac{1}{2} \times 3\frac{7}{8}$ oval No. 15 21/- 189/- darker centre $5\frac{1}{8} \times 3\frac{7}{4}$ oval No. 15 21/- 189/-

THIN ART BROWN or CREAM, with cambric surface. (For Cabinet.)

With moulded bevelled plate mark.

No. Size of Mount.

Thickness. Per 100 1000

2193 12 × 9 with bevelled plate mark

6 \times 4 $\frac{1}{4}$ square No. 5 10/- 90/2195 12 \times 9 with bevelled plate mark
5 $\frac{1}{2}$ \times 3 $\frac{7}{8}$ oval No. 5 10/- 90/-

THE "GRANTON." (For Cabinet.)

Cambric surface, brown, with coloured embossed centre, coloured bevelled edges, rounded corners.

No. Size of Mount.

Thickness. Per 100 1000
2212 11 × 7½ with embossed oval centre

 $5\frac{18}{16} \times 4\frac{1}{16}$ No. 15 18/- 162/- 2210 11 × $7\frac{1}{2}$ with embossed square centre $6\frac{1}{2} \times 4\frac{1}{2}$ No. 15 18/- 162/-

THE "DELPH." (For Promenade-Cabinet.)

In fine white, with choice embossed plate mark, and gray bevelled edges.

And in cream with brown bevelled edges.

No. Size of Mount.

Thickness. Per 100 1000

2220 8½ × 4½ white, with embossed plate mark

 $5\frac{3}{4} \times 2\frac{3}{4}$ [No. 9] 8/8 78/-2221 8 $\frac{1}{4} \times 4\frac{7}{8}$ cream with embossed plate mark . $5\frac{3}{4} \times 2\frac{3}{4}$ No. 9 8/8 78/-

CHRISTMAS AND CALENDAR MOUNTS.

A Series is prepared for each season, and Price Lists can be had on application.

Usual terms to the Trade, to whom samples and full lists will be sent on application.

MARION'S DAPERS

Manufactured at their Works, SOUTHGATE, MIDDLESEX,

MARIONA.

A P.O.P. for artistic effects. Glossy in White, Mauve or Pink. Matt in White. Full Sheets, 15/0 per quire. Also in cut sizes and gross boxes.

MARIONA, GROS GRAIN MATT.

White only. For broad effects. Full Sheets, 25/0 per quire. Also in cut sizes.

MARION'S OUICK-PRINT PAPER.

May be opened and developed in weak gaslight. In Glossy,

MARION'S BROMIDE PAPERS. Slow & Rapid.

Matt Smooth. Semi-Matt. Matt Rough. Glossy in White, Pink and Mauve. In all sizes.

MARION'S CELLULOID-CHLORIDE PAPER MATT.

SMOOTH.

/A high-class paper for
PLATINUM BLACK TONES.
CARBON RED TONES.
BROWN TONES.
DARK BLUE BLACK TONES.
SEPIA TONES.
PURPLE TONES.
DARK BLUE TONES.

In cut packets and full sheets.

Best, 25/0 per quire.

Second quality, 20/0 per quire.

MARION'S NEW MATT ALBUMEN P.O.P.

A sensitive paper yielding a variety of tones and requiring the most simple toning baths. The best results are obtained by toning with Platinum.

Full sheets, 23 in. \times 17½ in. 25/0 per quire.

MARION'S NEW MEZZO-TINT PAPER MATT.

This paper yields Sepia tones of great beauty. Per packet of 12 pieces, 1-plate, 1/0.

MARION'S SENSITIZED POST-CARDS.

ORDINARY SIZE (51 × 31).

P.O.P. Glossy, on superior quality car	Per Packet with 2 Ma d 6d.	sks. wi			Per 1000
Per Packet of with 2 Massas Bromide Matt. 6d. Quick-Print Matt 6d.	. with 2 M	lasks.	7/6 7/6	::	52/0 52/0
P.O.P. Glossy, No. 2 3/4 30/0 27/0	Brom	ide Glossy	, No. 2	3/4	Per 1000 30/0

MARION'S ENAMELLED STEEL WARE.

ENAMELLED STEEL. DISHES.

4/-



These dishes are of superior manufacture, and will be found to possess advantages over any others. They are light and strong, of a nice shape and depth—these points ensuring comfort to the user when developing. The enamel comp etely tages over any others. They are taged and stone, or a meet adjust appoints ensuring comfort to the user when developing. The enamel competely covers the steel and does not chip off; it is therefore impossible for the solutions to come into contact with the metal. All sizes from ‡-plate to 24 × 19.

\$\frac{1}{2}\$-plate 1/5 each. \$12 \times 10, \frac{3}{2}\$- \$18 \times 12, \frac{7}{2}\$ 24 \times 19. 16/6.

"HYPONO

THE UNIVERSAL HYPO ELIMINATOR.

MOST ECONOMICAL AND EFFICIENT.

THE GREATEST TIME AND WATER SAVER EVER INVENTED FOR THE USE OF THE PHOTOGRAPHER.

Prints treated with HYPONO are completely washed in eight minutes.

HYPONO is put up in bottles, price 1/-, to suit the profession and the amateur, post free, 1/5.

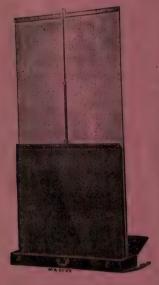
OF ALL DEALERS.

Sole Wholesale Agents -

= Freckleton's = Shading Screens.

Registered No. 346449.)

THE FRECKLETON SHADING SCREENS place in the hands of the Photographer a simple, quick, and effective means of producing the beautifully shaded pictures similar to the productions so well known from the Studios of the leading



Artists of the Profession. The whole secret of effective lighting lies in being able to rapidly shift the key of light so as to illuminate the chief portions of interest in the picture, at the same time shading the other portion. The use of the Freckleton Shading Screens is the road to effective lighting. They are indispensable in At Home portraiture, converting an ordinary window lighting in such a way that results are obtained equal to those of a well-equipped studio. The Tracing Cloth Screen will be found most useful to place in front of the Arc Lamp for evening work, or it may be used as a reflector.

The construction of the screens is novel and simple; they take up very little floor space, can be erected in a couple of minutes,

and are instantly adjustable to any height up to eight feet. The screens are on well-tested spring rollers, are 3 ft. 2 in. in width, with a telescopic rod extension up to 8 ft. high. They are fitted ready for instant use in a strong wooden box, and are most portable and compact.

Price 35/-

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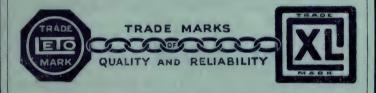
LETO

PHOTO MATERIALS CO. (1905) LTD.

MANUFACTURERS OF

PLATES, FILMS, PAPERS

AND ACCESSORIES



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The Leto Photo Materials Co. (1905) Ltd., having purchased the goodwill and business of Messrs. B. J. Edwards & Co., of Ealing, the manufacture of Edwards' plates, films and other specialities is continued by them at the same address.



Edwards' Iso Plates

(ISOCHROMATIC).

These plates were originally introduced in 1886 and are still in the front rank for speed and quality.

SNAP-SHOT 200-240 H. & D.

The colour sensitiveness of this plate has been rendered more even throughout the spectrum up to the orange. It is specially suitable for instantaneous work and portraiture.

INSTANTANEOUS 150-180 H. & D.

This plate is somewhat slower than the Snap-shot Iso and is specially useful for quick landscape work, interiors, flower studies, etc.

MEDIUM 100-120 H. & D.

A slow fine-grained plate specially intended for copying of all coloured objects, pictures, etc.

A. S. (AUTO SCREEN) 100-120 H. & D.

The latest advance in isochromatic plates. Perfect rendering of colour values without the use of a screen.

Edwards' XL Plates

(ORDINARY OR NON-ISO.)

190TOP

EMPIRE (250-350 H. & D.)

A very rapid fine grain plate specially suitable for Professional use in the studio and focal plane work,

SPECIAL RAPID SNAP-SHOT (200-240 H. & D.)

Invaluable for hand camera work, and specially suitable for rapid portraiture in the studio and all work requiring great rapidity.

RAPID (150-180 H. & D.)

A plate of medium rapidity, and allows great latitude in exposure. A fine plate for landscape work,

MEDIUM (100-120 H. & D.)

An excellent slow plate for use in the stand camera with time exposures. Allows very great latitude in exposure.

"HOSPITAL" X RAY.

Specially prepared for Röntgen X Ray work and electro-chemical experiments.

"KRISTAL."

Unrivalled for making lantern slides and transparencies by contact. The range of tone from pure black to ruby red and any intermediate tone is obtainable with ease and certainty. No darkroom required.

SPECIAL TRANSPARENCY.

A more rapid plate than the "Kristal"; for either contact or reduction in the camera. Yields slides of the highest quality with full gradation, giving clear high-lights and transparent shadows.

LETO GASLIGHT PAPER.

The Companion Paper to Seltona; unequalled for gradation and depth, with absolute freedom from fog in manipulation. Allows full control of half-tones, great latitude of exposure, and unrivalled for the beautiful rendering of detail in the high-lights and shadows.

MADE IN EIGHT GRADES.

MATTE SMOOTH.

A particularly pleasing carbon surface. The grade for all-round work.

SPECIAL PORTRAIT.

For Soft results from vigorous negatives. The surface is the same as the Matt Smooth.

PLATINO MATT.

A perfectly dead matt of peculiar velvety softness.

VELLUM.

The new rich semi-matt grade for richness and depth. Fine carbon effect.

MATTE ROUGH.

A moderately rough white-surfaced paper, for softness and depth,

CREAM SMOOTH.

A delicate cream-tinted paper, specially suited for sepia toning.

CREAM ROUGH.

For broad effects, suitable for all landscape and large pictorial work.

GLOSSY. For all detail work and highly-enamelled prints.

SELTONING PAPER.

Seltona Collodion Paper, first introduced in 1903, has obtained such a firm hold on the photographic public the world over for its excellence of quality, uniformity of deliveries, and permanency of the finished prints, as to make it the premier paper of the day.

Seltona contains all necessary chemicals for toning in the emulsion, and therefore needs fixing in hypo only. The gold is present in not only the most convenient form, but in a condition where it can do its work of toning to the best advantage, in fact much better than with ordinary P.O.P., even when toned in separate toning and fixing baths. The correctness of this assertion can be proved by the fact that with Seltona double tones are non-existent.

The tone of Seltona prints is at once clear, bright and fresh in appearance; there is not the slightest difficulty in obtaining a whole batch of prints alike.

MADE IN FOUR DISTINCT GRADES TO SUIT THE MOST EXACTING TASTES.

MATTE SMOOTH.

A white paper with beautiful carbon surface, giving prints full of delicacy and detail.

CREAM SMOOTH.

A delicately cream-tinted paper with a surface entirely its own, giving prints of peculiar richness and lustre typical of carbon.

ANTIQUE WHITE.

A fine grain-surface paper, giving softness and depth, without injury to detail or definition.

GLOSSY MAUVE.

A splendid paper for all detail work and enamelled prints.

LETO-MATT Collodion Papers.

LETO-PLATINO.

The Matt C.C. Paper of approved quality. Unrivalled for its beautiful delicacy, giving the most perfect carbon-like effects and a wide range of tones from rich red brown to pure black. Always uniform and regular in manufacture.

Made in two surfaces:

SMOOTH—A fine carbon surface, giving prints of great delicacy and detail.

ANTIQUE—A fine grain paper, which gives softness and depth without loss of detail.

LETO-PLUTO.

A Matt C.C. Paper, specially prepared for single platinum toning. No gold bath required.

One grade: Smooth Carbon Surface.

LETO-CHAMOIS.

This paper is for toning in a single platinum bath, with which it gives a warm black carbon colour. The charm of Leto-Chamois is its delicate matt surface and strong texture. The colour of the paper being a delicate cream renders to the high-lights a soft half-tone, while the shadows have a luminous brilliancy so characteristic of carbon.

LETO P.O.P.

A Gelatino-Chloride Paper of superb quality, giving rich, brilliant prints, free from double tones.

LETO COLLODION PAPER.

A high-grade glossy Collodio-Chloride Paper of even and perfect coating. Gives prints unrivalled for their general excellency in beauty and richness of tone.

LETO TINTONA.

A new and novel series of daylight printing-out papers with a tinted base. Made in four tints: Cream, Blue, Green and Steel Grey. Needs fixing only.

LETO BROMIDE.

A paper of superb quality, equally suitable for enlarging and contact work. Always uniform and reliable. Five grades: Matt Smooth, Vellum (semimatt), Glossy, Rough (white and cream).

LETO TONERS.

For toning bromide and gaslight prints to all shades of blue, green, brown or red, with ease and certainty. The tones are very pure and rich in colour. In I/- Cartons.

REMBROL (Registered).

A new developer for density and control. Specially designed to meet the requirements of amateur photographers wishing to obtain negatives full of density and detail, fine colour and quick-printing qualities. In Bottles, 1/-, 2/- and 3/6.

LETO SEPIA TONER.

An improved sepia toning for bromide and gaslight prints, giving tones of beautiful purity and clear whites. In Cartons, I/- each.

SEND FOR FULL DETAILED PRICE LIST.

"BOARDOID" PHOTOGRAPHY.

This New Method of Finishing Prints not only enhances their pictorial value, but forms a most artistic novelty, which is appreciated by every photographer.

The "Boardoid" Method comprises the printing of a negative on a "Boardoid" and, by masking, leaving a broad border round the print, which is then plate-marked with the Leto Plate-Marker, and finally inserted in a Leto Cover Mount.

The simplicity and artistic effect of this method has earned the highest praise from the profession, amateurs and the trade.

- LETO COVER MOUNTS and LETO PLATE-MARKERS are made in a large variety of sizes. From I/- upwards.
- OUTFITS FOR "BOARDOID" PHOTOGRAPHY are supplied, comprising all necessary materials, including Cover Mounts, Plate-Marker and Boardoids. From I/to 4/6 complete.
- LETO WIDE MARGIN MASKS. Made in three series, with large variety of openings. In I/- packets.
- LETO TRIPLE MASK. For margin or shaded border printing.

 Ensures correct registration for printing borders. Made in four sizes. From I/- upwards.
- LETO TITLING METHOD. A new and simple method of titling prints without injury to either negative or paper.

 Direct writing. No reversal. Outfits, 2/- complete.
- For Full Particulars of "BOARDOID" PHOTOGRAPHY write for Lists 15 and 20, and Complete Price List.

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ARRIDGED CATALOGUE 1910.

NOVELTIES

"UNIT" Patent Self-capping Time and Inst.

Focal Plane Shutten

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"UNITA" Collapsible Hand Camera	•••	page	191
"UNIT" FOCAL PLANE FIELD Camer	а		
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UNEEKA ENLARGER	•••	page	201
IMPROVED "SUNBEAM" and "WAF			

THE THORNTON-PICKARD MANFG. CO., LTD., Complete Catalogue ALTRINCHAM.

Ready in January.

Cameras

BRITISH-MADE CAMER

SELL Ы **≷** CAMERAS ALL

... page 174

pages 192 & 193

Terms of Business.

RETAIL ORDERS. The prices in this Catalogue are strictly nett. is respectfully requested that all orders be accompanied by remittance unless

references have previously been given and an account opened.

REMITTANCES. Cheques or Post Office Orders to be made payable to the Thornton-Pickard Manufacturing Co., Limited, and may be crossed Lloyds Bank, Ltd. P.O. Orders should be made payable at Altrincham. Postage Stamps may be used for the payment of small amounts. Foreign Orders are payable by P.O. Orders at Altrincham, or by Draft on London or Manchester

ACCOUNTS. Monthly statements are rendered Nett, and are payable without any further deduction on or before the 15th of the month following date of Invoice

"ON APPROVAL." All Goods made by the Thornton-Pickard Manufacturing Co., Limited, may be obtained through any dealer in Photographic Apparatus, or they will be sent direct on "on approval" terms, if remittance for the amount accompanies order. The goods to be returned, carriage paid, within three days, if not approved.

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PACKING. Experienced packers only are employed, and every care is taken to ensure safe transit. We do not, therefore, hold ourselves responsible for any loss or damage that may occur after the goods leave our premises. Packing boxes are charged at the lowest rate, and are not returnable.

RUBBER MOULDING.

THORNTON-PICKARD PATENT.

Made in different thicknesses as shown.

Price 81 less quantity. per foot, or any



10" 39 2" 30 5,11 FITTING.—It should be cut to the required length with a sharp knife, and sprung into the aperture with the rib or flange on the inside.

E RECORDER. For DARK SLIDES or PLATE HOLDERS.

Price

FORE EXPOSURE

Each. Postage 1d. Also supplied

on Cards of Six, Price 3/-



Shows at a glance which plates have been exposed. Prevents two pictures being taken on one plate.

This simple little device has proved a great success. It ought to be fitted to every Dark Slide and Plate Holder. It records automatically which plates have been exposed and which have not.

Full instructions for Fitting sent out with each eard

Complete Catalogue, Published in January, post free.

Thornton-Pickard Manufacturing Co., Ltd., ALTRINCHAM.



Exposure 3 seconds, Prize Picture. "BUBBLES."

Mr. FDGAR SIMPSON.



Exposure 3 seconds.
Prize Picture.

"THE LADY PIANIST."

Mr. KEITH DANNATT.

Thornton-Pickard Patent Standard Pattern Time and Instantaneous Shutter.

in every part of the civilised world the Thornton-Pickard Standard Pattern Time and Instantaneous Shutter is well known. It was the First successful Time and Instantaneous Shutter invented, and was in reality the one which made Instantaneous Photography practicable.

This Shutter is built on the

Roller Blind principle, which is acknowledged by the majority of Experts to be far superior to, and much more efficient and reliable than any other system ever introduced.

This is the Shutter recom-mended for general work or every-day Photography. It is constructed in mahogany,

beautifully finished, and is made to fit on the Lens Hood or Tube or behind the Lens on the Camera Front. The two smallest sizes are capable of giving:

Instantaneous Exposures up to 1/90 second, in the two smaller sizes. (Larger sizes work pro-portionately slower.)

Prolonged Time Exposures of any duration.

Splendid Bhutter for General Work. PATENT

With the addition of the Patent Time Exposure Valve (8/6 extra) as shown near the ball in the illustration, the Shutter will also give automatically Short "Time" Exposures of 1, 1, 2, 1, 2, and 3 seconds.

These Exposures are oft-required and extremely useful in practice, and with this Valve are obtained in a much more accurate manner than by any other means.

PRICES.	SIZE	to fit	on a	Lens H	ood or	Tube	up to	inches	diam.
Speed Indicator included.	11/2	15	2	21/2	3	81/2	4	41/2	5
Standard Pattern Behind Lens	14/6 15/6	15/- 16/-	16/- 17/6		21/- 22/6	25/- 26/6	30/- 31/6	35/- 36/6	38/- 39/6

Patent Time Exposure Valve 3/6 extra.

New Patent Disappearing Cord, which runs back into the Shutter Box after setting, 3/6 extra. Fitted to Shutters previously supplied 5/-.

The Speed Indicator, an attachment showing at what speed Shutter is working, is now fitted to all Thornton-Pickard Shutters without extra charge.

SOLE WHOLESALE AGENTS IN THE U.S.A.. For Thornton-Pickard Roller-Blind Shutters.

BURKE & JAMES, 118-132, West Jackson Boulevard, CHICAGO.

The THORNTON-NEW AND IMPROVED PATENT PICKARD

ROYAL" SHUTTER

(Time and Instantaneous).



The " Royal " Shutter is constructed on the Roller Blind principle, the same as the Standard Pattern Shutter as described on the previous page, and works at the same speeds. Its chief advantages over the standard pattern are that in the "Royal" Shutter PARTS ARE ENCLOSED WITHIN THE SHUTTER BOX. It is also fitted with a new and pattern and standard pattern are that in the "Royal" Shutter BOX. and patented device which automatically releases the Spring when the Shutter is set at "Time." This is a very impor-

tant invention, as the Shutter cannot be worked for "Time" otherwise than as it should be, i.e. at low tension, and all fear of damage to the mechanism is thereby removed.

Dimensions of Smallest Size:

 $3\frac{3}{8} \times 2\frac{1}{8} \times 1$ in. thick including all projections.

PRICE LIST OF "ROYAL" SHUTTERS (Speed Indicator included).

SIZE:-To fit on Lens Hood or Tube, up to inches diameter.	11/2	15	2	21/2	3
Before Lens Model	19/-	19/6	20/-	23/6	26/6
	20/-	20/6	21/6	25/-	28/-

Patent Time Exposure Valve, 3/6 extra. Patent Disappearing Cord, 3/6 extra.

THORNTON-PICKARD PATENT

ime Exposure

By means of this extremely ingenious yet simple invention, fitted to any pattern of our Time and Instantaneous Shutters, Short Time Exposures of 1, 2, 1, 2, and seconds can be obtained automatically, with a much greater degree of accuracy than by any other means. This attachment greatly to the practical utility of any Shutter to which it is fitted, and it is strongly recommended. It costs only 3/6 extra, and no user of

For short time exposures. 1, 1, 1, 2, and 3



Can also be fitted to any Between-Lens Shutter which gives a "BULB" Exposure.

a Time and Instantaneous Shutter should be without it. It is fitted to the rubber Release of Shutter.

PRICE:

Fitted to any new Thornton-Pickard Time and Inst. Shutter, or to any Time and Inst. Shutter sent to us for that purpose

With new Ordinary Ball, Tube and Teat, 2/- extra. If the Shutter cannot be sent to us for fitting, we can supply the Valve complete with Arabesque Ball, Tube,

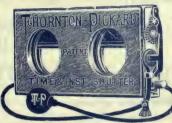
5/6

3/6

STEREOSCOPIC SHUTTERS.

Made in Before and Behind Lens Patterns and also with Adjustable Centres.

Stereoscopic Pictures are greatly favoured by many amateurs, and for this class of work the Shutter here shown is extremely suitable, and in fact superior to any other form. It is made on exactly the same principle as the Standard Pattern Shutter described on page 171, and works at the same speeds, giving exposures up to south of a second in the two smallest sizes, as well as Time Exposures of any duration.



PRICE LIST.

Size, to fit on a Lens Hood or Tube up to inches dia.	11/2	15	2	21/2
Stereoscopic Time & Inst., at 3in. or 3½in. centres. Behind Lens	20/- 22/6	21/- 23/6	23/- 25/6	27/- 29/6
3½in. centres, 2/- extra; 3½in. centres, 4/- extra.	Adj	ustabl	e Pan	el

3½m. centres, 2/- extra; 3½m. centres, 4/- extra. Adjustable Panel for Behind Lens Pattern, 7/6 extra. New Patent Disappearing Cord, 3/6 extra. Patent Time Exposure Valve, 3/6 extra.

Self-Capping Blind fitted to Time & Instantaneous & Stereo Shutters at a charge of 5/- extra for Time and Instantaneous Shutters up to 2½in. size. Stereo Shutters 10/- extra.

Thornton-Pickard New Patent

STUDIO SHUTTER.

Works in Front of the Lens or Inside the Camera.

Exposures of ith sec. and longer duration, THE MOST PERFECT AND SUCCESSFUL STUDIO SHUTTER IN THE MARKET. NO VIBRATION. PRACTICALLY NOISELESS IN WORKING.

A BOON TO THE PROFESSIONAL.
NO STUDIO SHOULD BE WITHOUT IT.
Specially designed for Studio use where silence in working is a desideratum. For photographing children,

animals, and nervous subjects generally.



PRICES.	Tof	fit on Lei	ns Hood	or Tube	up to in	s. diame	ter.
PRICES.	2	21/2	3	31/2	4	41/2	5
Silent Studio Shutter	20/6	23/6	27/6	32/6	37/6	42/6	47/6

N.B.—Speed Indicator is not required with the Studio Shutter and is therefore not fitted.

BURKE & JAMES, 118-132, West Jackson Boulevard, Chicago.

The Simplest and most Perfect Focal Plane Shutter in the World

is the

THORNTON-PICKARD PATENT

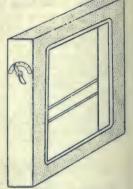
"UNIT" SELF-CAPPING

FOCAL PLANE SHUTTER

Particulars of Quarter-plate size:— Dimensions: $6'' \times 5_3^{2}''$ wide $\times 1_{3_2}^{1}''$ thick. Weight: 15oz. (Projections $\frac{2}{3}''$ on width).

Price 70/-

Made in $\frac{1}{4}$ -plate, $5'' \times 4''$ and Postcard, $\frac{1}{2}$ -plate, $7'' \times 5''$, and 13×18 c/m sizes.



View of Shutter showing Combination Winding Key and Slit Adjuster, which is the special point of simplicity and superiority in the "Unit" Focal.

The superiority of the Focal Plane type of Roller-blind Shutter over every other pattern is an absolutely admitted and established fact. Its high co-efficiency has always made it a special favourite with serious photographic workers, for on account of its working in the "focal plane" immediately in front of the sensitized plate, practically the whole quantity of light admitted by the Lens is utilised in the exposure.

The chief objections which have hitherto prevented the universal adoption of the Focal Plane Shutter are briefly as follows:—

1. The numerous adjustments necessary for its efficient working.

The failure to work for "Time" without detracting from the efficiency of the higher speeds.

3. The absence of a Self-capping Blind—unless with complicated

mechanism liable to get out of order.

The introduction of the new "Unit" Self-capping Focal Plane Shutter completely banishes all these objections, and the expert photographer's ideal is now realized, as this Shutter possesses every one of the long-sought-for advantages, viz.:—

Extreme simplicity in working, the Shutter being practically Selfadjusting and Automatic throughout.

Efficient "Time" Exposures without interfering with the higher speeds.

An Everset Self-capping Blind, free from complication.

Anyone who can turn a key can work the "Unit" Focal.

THE THORNTON-PICKARD NEW PATENT

"UNIT" SELF-CAPPING TIME AND INST.

This Shutter will work a revolution in Photographic Apparatus. It is the greatest original advance in Focal Plane Shutters since the introduction of an Adjustable Slit in our first pattern Focal Plane Shutter twenty-one years ago. The new and striking points in the New "Unit" Focal Plane Shutter, as enumerated below, represent new ideas and principles in construction and working.

Special Points of the "UNIT" Shutter:

Instantaneous Exposures from 15th to 1000th. Time Exposures from seconds to hours, or of any duration.

Adjustable Slit with 6 different sized Apertures.

Square Aperture opening Shutter.

Automatic Self-capping Blind. Automatic Self-adjusting Slit.

One Setting Key only.

No Lever to move to change from Time to Instantaneous, or vice-versa.

One Turn to Set; One Press to Release.

No complicated Mechanism.

Smooth free-working of Shutter.

Blind always perfectly taut. No sagging.

Blind sets and closes as straight as a metal plate. Perfect combination of Simplicity and Efficiency.

One and the same operation of turning the Winding Key both Sets the Shutter and Varies the Speed.

ONE AND THE SAME TURN OF THE

WINDING

KEY

BOTH

SETS THE

"UNIT"

FOCAL

AND

ADJUSTS

WIDTH

OF SLIT

IN BLIND.

This Focal Plane Shutter has been named the "UNIT" owing to the fact that its adjustments are effected and the Shutter set by one and the same operation. This operation consists in simply turning the Winding Key which effects the following :-

It sets the Shutter for exposure.
 It automatically adjusts the Slit to the desired width.
 It varies the duration of the exposure.
 It alters the Shutter for Time and Instantaneous at will.

5. It maintains the aperture covered with the Self-capping Blind until the actual exposure.

"UNIT" is the World's Simplest and Supreme Focal Plane Shutter,

PRICES.

1-Plate (41×31) ... 70/-5×4 and Postcard.. 77/6

84/-1-Plate (61×43) ...

 $7 \times 5 \& 13 \times 18 \text{ e/m}...$ 90/-

THORNTON-PICKARD PATENT

Focal Plane Shutters.



For the successful photographing of Fiying Birds, Animals in Motion, Men Jumping and Running, Cycle Racing, Athletic Sports, and all rapidly moving objects, a Shutter of this type is indispensable. It fits at the back of the Camera, and works immediately in front of the plate. It gives a shorter exposure and passes a larger percentage of light than any other form. The Speeds of all our Focal Plane Shutters range from 2th to 1500th of a second.

Thornton-Pickard Focal Plane Shutters are made in four different models. The cheapest pattern is the No. 1 or Original Model, which is quite as efficient and prac-

Model, which is quite as efficient and practical as any Focal Plane Shutter made.

In this Original Model the Blind Slit is adjusted by means of small chains which have to be lengthened or shortened as required by the operator.

No. 1 Model Focal Plane.

THE Nos. 2 and 3 MODELS.

The Nos. 2 and 3 Models of Focal Plane Shutter are improvements upon the pattern above described. The Slit in the Blind of each of these Shutters is adjusted from the outside by simply rotating a knob. The principle of construction is different, but the two Shutters possess the same practical advantages, and are more convenient in use than the original No. 1 pattern.

Our "Unit," the latest, simplest, and most perfect Focal Plane Shutter ever invented is described on the two following pages.



No. 3 Model Focal Plane.

ADVANTAGES OF Nos. 2 and 3 Models Focal Plane Shutter.

Adjustable Slit Opened and Closed

from Outside. Outside Indicator Showing Width of Slit.

Outside Indicator Showing Spring Tension.

New Speed Tablet, showing at a glance the requisite combination of Blind Slit and Spring Tension for any given exposure.

FOR FITTING. The Reversing Back and a Dark Slide should be sent to us. A charge of from 5/- to 10/- is made, according to work required. The fitting is done gratis to current patterns of Thornton-Pickard Cameras.

PRICES, including Speed Indicator and Speed Tablet.

No. 2 MODEL (With Outside Adjustments).

5×4..£2 10 0 | 10×8..£4 4 0 | 12×10..£5 5 0 | 9×12 c/m £2 10 0 | 18×24 c/m £4 4 0

No. 3 MODEL (With Outside Adjustments).

 -Plate $(4\frac{1}{4} \times 3\frac{1}{4})$...
 £2
 5
 0
 $7\frac{1}{2} \times 5$...
 £3
 6
 0
 Whole Plate

 -Plate $(6\frac{1}{2} \times 4\frac{3}{4})$...
 £2
 15
 0
 13
 ×18
 c/m.
 ...
 £3
 6
 0
 £3
 10
 0



PRICE LIST

of the

Thornton-Pickard

SHUTTER RELEASES

and

Gas Tubing

The "Arabesque" Balls and Tubes, supplied by us, are all specially made for our Shutters from the best pure Para Rubber and are unequalled in quality an I durability.

NO. 1 2 3 4	Standard I Between-La Small Size	Arabesque'' Rubber Releases. Pattern "Arabesque" Round Ball, Tube, and Teat ens Shutter Oval Ball, Tube without Teat Oval Ball and Tube ter Release, Ball Tube and Bellows Teat e" Shutter Tubing Gas Tubing No. 1, 35 in. bore, 75 in. walls "No. 2, 35 in. "15 in. " Teats Studio Bellows Teats	S. D. 2 0 1 9 1 6 3 0 0 6 0 8 0 10 1 0 0 4 1 0
		lack and Red Rubber Releases.	
5 6 7 8	Black Enar Red Polish	nelled Rubber Ball Tube and Teat	1 6 1 3 0 9 0 6 0 3 0 3
	No. 2	Tain. bore, 60ft. lengths, 13s. 6d. per foot Tain. , 60ft. 18s. 1½in.	0 3 0 4 0 7
	Larg	e Sized "Arabesque" Round Balls.	
	DIAMETER.	WORKING CAPACITY.	
0 1 3 4 6	1½in. 1¼in. 2¼in. 2½in. 3in.	Ordinary Ball for 2ft. For Studio Shutter Release For Tubing up to 30ft. long " 50ft. " " 100ft. "	1 0 1 4 3 0 4 0 6 0
1 8 4	For Tubing	ear-Shaped Red Polished Balls. up to 15ft. long	1 6 2 0 2 6

THE THORNTON-PICKARD PATENT

RUB

Latest Improved Model.

> The World's Standard



HIGH. CLASS CAMERA.

Represents the greatest achievement In

the Art of Camera Construction.

The "ROYAL RUBY" is the last word in Stand Cameras. Perfect in design, embracing every practical movement, and a great number of Reserve Adjustments for the most intricate work and every conceivable emergency, fitted together with the care and accuracy of an instrument of precision, rigorously tested and verified in every detail, this Camera, when it leaves our Factory, is in every respect an instrument which any photographer might justly feel proud to possess. It is unquestionably the greatest triumph yet achieved in the making of Photographic Apparatus, and such is the reputation it has gained that it is best known as the

. In the latest model the apex of perfection has been attained by the introduction of the "Omnifex" Rising, Falling, Extending, and Swinging Front of simplified yet most efficient design. This "Omnifiex" Front is unlike and superior to any other Swinging Camera Front device.

It is impossible to give here any adequate conception of what this Camera really is; suffice it to say that it is the very best production of the Best British Camera Makers, and is strongly recommended to all in search of the finest all-round Camera procurable. The prices are, for such an Outfit, very moderate, and no purchaser can experience but the greatest pleasure and satisfaction in acquiring a "Boyal Ruhy" faction in acquiring a "Royal Ruby."

A few of its most salient features are enumerated below.

"Omnifiex" Extending and Swinging Front.

Triple Extension Baseboard and Bellows.

Considerable rise to front.

Fall to front.

Independent Rack and Pinion Rise to front panel at shortest focus.

Independent Rack and Pinion Fall to front panel at shortest focus.

Rack and Pinion Cross Front Movement. Short Focus Movement at front of

Camera; no protruding baseboard, no cutting off.

Improved pattern Folding Front, locking automatically in position.

Rising Front, brassbound on sides, preventing wear and tear.

Triple Swing to Front, Back-ward, Forward, and Independent Swing.

Triple Swing to Back, Backward, Forward, and Side Swing.

Automatic Spring Stretchers to Front and Back.

greater range of movements, with greater latitude than any other Camera made.

SEE PRICE LIST NEXT PAGE. STANDARD and "OVERSEAS" (TRAK) Patterns.

THORNTON-PICKARD

'ROYAL RUBY' TRIPLE EXTENSION OUTFITS.

With various makes of Lenses.

Two qualities of Cameras are listed below, viz., the Standard Pattern Mahogany and the "Overseas" pattern. The "Overseas" Model is in all respects similar to the Standard Pattern Camera, but it is built of Seasoned Teak throughout, a wood expressly selected for its damp and heat resisting qualities. Every joint is specially strengthened by being screwed as well as glued, and the glue used is of special waterproof quality.

The Brassbound "Overseas" Models make ideal outfits for any climate, and will easily withstand the most severe atmospheric changes.

SPECIFICATION.

Camera with Turntable, Threefold Automatic English Ash Tripod, "Royal" Time and Inst. Shutter with Speed Indicator, Best Quality Double Bookform Dark Slide with hinged metal Division, and Lens as per list.

SIZES AND PRICES OF OUTFITS.

No.	Outfit with Lens.	Series	Largest ap't're	Half-plate	7½×5 13×18 c/m	Wh'l'-plate	10×8 18×24 c/m
1	Thornton-Pickard PANTOPLANAT Do. "Overseas" made in Teak	_	F8	10 10 0 11 15 0	12 10 0 14 0 0	15 0 0 16 10 0	18 10 0 20 10 0
2 2A	Thornton-Pickard 'RUBY ANASTIGMAT' Do. "Overseas"	_	F 6.8	13 5 0 14 10 0	15 10 0 17 0 0	18 10 0 20 0 0	21 10 0 23 10 0
3 3A	Beck "ISOSTICMAR" Do. "Overseas"	III	F7.7	11 15 0 13 0 0	13 15 0 15 5 0	16 5 0 17 15 0	_
4 4A	Beck "ISOSTIGMAR" Do. "Overseas"	II	F5.8	12 17 6 14 2 6	14 17 6 16 7 6	=	_
5 5A	Ross " HOMOCENTRIC "	III	F6.3	14 15 0 16 0 0	18 0 0 19 10 0	22 0 0 23 10 0	27 0 0 29 0 0
6 6A	Ross" HOMOCENTRIC" Do. "Overseas"	11	F5.6	16 5 0 17 10 0	19 10 0 21 0 0	24 10 0 26 0 0	31 10 0 33 10 0
7 7A	Aidis "ANASTIGMAT" Do. "Overseas"	Serie 13×18 pl. Se	plate es II. F6 c/m & 1/1 eries III. F7.7	13 2 6 14 7 6	13 5 0 14 15 0	15 10 0 17 0 0	_
8 8A	Cooke" ANASTICMAT" Do. "Overseas"	111	F6.5	14 17 0 16 2 0	17 3 0 18 13 0	21 4 0 22 14 0	27 18 6 29 18 6
9 9A	Dailmeyer "STIGMATIC" Do "Overseas"	IV	F6.3	13 10 0 14 15 0	16 15 0 18 5 0	_	_
10 10A	Dailmeyer "STIGMATIC" Do. "Overseas"	II	. F 6	17 7 6 18 12 6	21 10 0 23 0 0	26 0 0 27 10 0	33 0 0 35 0 0
11 11A	Goerz "DACOR" Do. "Overseas"	III	F6.8	16 10 0 17 15 0	19 15 0 21 5 0	23 0 0 24 10 0	29 15 0 31 15 0
			seas"	25/-	- 30/-	30/-	40/-
	ra Bookform Mahogany Do. TEAK assbinding to either pat	do.	080	h 22/6	20/- 28/- 5/-	22/6 27/6 5/-	30/- 35/6 5/6



THE THORNTON - PICKARD

NEW 1910

IMPROVED

PATTERN

Special RIBV

THE MASTERPIECE OF MEDIUM-PRICED CAMERAS. NEW RACK & PINION RISING PANEL.

NEW SIDE SWING.

With Beck Symmetrical Lens, F/8 £6. 10.

Brassbound Outfit

The "Special Ruby" is a medium-priced Camera Outfit to meet the demand for a pattern superior to the "Imperial" Series, and yet lower in price than the "Royal Ruby."

The "Special Ruby" possesses most of the noted features of the "Royal Ruby," which have made that Camera so greatly esteemed amongst prominent workers, including the "Omnifiex" Rising, Falling, Swinging, and Extend-Ing Front. From the resumé given below, of the movements and adjustments embraced, it will readily be seen by those who desire a first-class Camera, yet do not wish to go to the expense of the "Royal Ruby," that the "Special Ruby" is the nearest approach to their ideal, and a splendid compromise.

PRINCIPAL PRACTICAL POINTS OF THE CAMERA. "Omnifiex" Rising, Falling, Swinging, and Extending Front, similar in pattern to the "Royal Ruby."

Extra Wide Front and Bellows, preventing all "cutting off" with shortest focus lenses, and making the Camera adaptable for Stero. Work when required.

required.

Camera Body racks forward on baseboard for focussing purposes. Also focussing effected by Front Pinion Head in ordinary manner.

Improved Folding Front, with practically automatic erection.

Automatic Spring Stretchers to Front and Back of Camera.

Rising and Falling Front of great latitude.

Independent Rising and Falling Panel, operated by Rack and Pinion,
usable at shortest focus.

Cross Front, Triple Extension, Alternative Wide Angle Movements, Swinging Movements in all directions, &c., including SIDE SWING to Camera Back. &c.. &c.

SPECIFICATION AND PRICES.

"Special Ruby "Triple Extension Camera, with "Omnifiex" Rising, Falling, Swinging, and Extending Front, and all other adjustments comprehensive and complete. Extra Wide Real Leather Bellows, Brass Turntable, Three-fold ash Rule-joi t Tripod, Tune and Inst. Thornton-Pickard Roller Blind Shutter, speeds to the second, and Time Exposures. One Double Bookform Dark Slide, Double-Hinged Focussing Screen, and Beck Symmetrical Lens with Iris F/8.

*-PLATE ... £6. 10. 0 STEREO. OUTFIT ... £8.10.0

Double Slides, each .. 8/6 Waterproof Carrying Case "K" .. 9/N.B.—The Stereo Outfit consists of Camera, &c., as per Specification, with Extra Double Slides, each the addition of a pair of Beck Symmetrical Lenses, Stereo. Division, and Stereo. Shutter in place of ordinary Time and Instantaneous. The Outfit is thus suitable for 1-plate and Stereo work at will.

The Thornton-Pickard 1910 PATTERN PERFECTA"

THE ABSOLUTE PERFECTION OF LOW-PRICED SETS.

The Principal Camera Outfit of the "IMPERIAL" Series.



A Triple Extension Camera fitted with MODIFIED

"OMNIFLEX"
Swinging Front.

Also provided with NEW THREE-BAR FRONT and

RACKWORK FOCUSSING BODY.

a most convenient and practical movement, eliminating all focussing difficulties.

NEW SIDE SWING TO BODY.

PRACTICAL MOVEMENTS.

Triple Extension, J-pl., 22". I-pl., 28"
Short Extension.
Three Racks and Pinions.
RACKWORK FOCUSSING BODY.
Rising, Falling, and Cross Front.
Independent Rising Front, operated
by Rack and Pinion.
Modified "OMNIFLEX" Swinging

and Extending Front.

Swing Back, Forward, Backward, and

Side Swing.
Reversing Back.
Lens convertible for Lond Foot

Lens convertible for Long Focus Views.

"Perfecta" Outfit, as below, but with T.-P. "RUBY ANASTIGMAT" Lens, F/6-8.

6×4 and P	osteard	 £7 1	12	6
-Plate .		 E8 1	0	0
-Plate .		 £12 1	0	0
$13 \times 18 \text{ c/m}$.		 £10	6	C

"PERFECTA" Outfit, large sizes, with Beck Symmetrical Lens with Iris Diaphragm F/8.

10×8 and 13×24 c/m ... £12 0 0 12×10 and 24×30 c/m ... £14 15 0

SPECIFICATION AND PRICES.

TRIPLE EXTENSION CAMERA, with all movements as above, including "Omniflex" Swinging Front, Brass Turntable; Beck Symmetrical Lens, with Iris Diaphragm 1/β; Double Bookform Dark Slide, with hinged division; Three-folu Stand; Thornton-Pickard Time and Instantaneous Shutter, with Speed Indicator. Camera fitted with Real Leather Bellows.

Outfit with Lens.	5×4	& P.	c.	}-r	late		13×	18 c/:	m.	}-I	Plate	В.
Outfit as above, with Beck Symmetrical Lens. With Beck Isostigmar III. F/7 With TP. Ruby Anastigmat F/6.8. "Ross Homocentric III. F/6.3. "Dallmeyer Stigmatic IV. F/6.3. "II. F/6. "TP." Pantoplanat" F/6 Extra Slides, each Carrying Case, K Time Exposure Valve to Shutter	£4 5 7 8 7 9 4	10 17 12 12 12 17 15 8 7	0666660066	10	10	0	10	6 16 6 16 11 10 10 10 10	000000000000000000000000000000000000000	£7 9 12 16 20 7	7 12 10 0 15 14 11 3	000000000000000000000000000000000000000

THE THORNTON-PICKARD

IMPERIAL

REE-BAR

is unquestionably the finest Camera ever supplied at the price. The New Three-Bar Front is a superb improvement. The Three Brass Bars not only considerably strengthen the front. but are also a most beautiful addition without any appreciable increase in the weight.



First introduced in a 70/- and 75/- Outfit Special Features by The Thornton-Pickard Co., Ltd.

EXTRA WIDE CAMERA FRONT. TRUE TRIPLE EXTENSION. REAL LEATHER BELLOWS, WITH WIDE AND DEEP MOUTH.

AUTOMATIC SELF-LOCKING STRETCHERS, ENSURING TRUE PERPEN-DICULAR OF FRONT AND BACK.

SPRING AUTOMATIC LOCKING CATCHES TO CAMERA FRONT.
INDEPENDENT RISING AND FALLING FRONT PANEL USABLE AT SHORTEST
FOCUS. BRASS FORK TO RISING FRONT.
CROSS FRONT, WITH AUTOMATIC STOP.
Previous to the Introduction of the "Imperial" these advantages were only

obtained in very expensive Cameras.

SPECIFICATION.

ra, with all practical movements, including Triple Swing Back; Rising, Falling, and Cross Front; Triple Swing Front; Triple Extension; Short Focus; Reversing Back; Dcuble Rack and Pinion; Brass Turntable; Beck Symmetrical Lens, with Iris Diaphragm f/8; one Double Bookform Dark Slide, with hinged division: Three-fold Stand; Thornton-Pickard Time and Instantaneous Shutter, with Speed Indicator.

COMPLETE OUTFIT with LENS.	4-plate 44×34	5×4 and Post Card		13×18 c/m and 7×5	$\begin{array}{c} 1/1\\ \text{plate}\\ 8\frac{1}{2} \times 6\frac{1}{2} \end{array}$	10×8 and 18×24 c/m	12×10 and 24×30 c/m
With Beck Symmetrical as specified	67/6	70/-	75/-	90/-	117/6	210/-	245/-
With Thornton- Pickard "Planto- planat" F/8	72/6	75/-	80/-	95/-	127/6	225/-	260/-
With Thornton- Pickard "Recto- planat" F/8	65/-	67/6	70/-	90/-	110/-	210/-	240/-

Teak "OVERSEAS" Imperial Half-Whole-95/-147/6 plate See also page 186. plate.

SPECIAL OFFER. 2-PLATE "Imperial" with "ALDIS" | 90/-

EXPOSURES TO 1/1000 SECOND

Are now obtainable with the

THORNTON-PICKARD Improved Pattern

FOCAL PLANE IMPERIAL TWO-SHUTTER CAMERA.



Equally suitable for ordinary Work, as well as for Copying, Enlarging, and Telephotography.

Time

Time and Instantaneous BEHIND LENS SHUTTER. Instantaneous Exposures from 1/2 to 3/3 of a second.

With Patent Time Exposure Valve (8/6 extra), Short Automatic Time Exposures of \(\frac{1}{2}, \frac{1}{2}, \frac{1}{2}, 1, 2, \text{ and 3 seconds.} \)

This Camera, which is sold as a Complete Outfit, is generally similar to the "Imperial Triple Extension" Outfit as described on page 182, but with the addition of a Special pattern Focal Plane Shutter built in the Camera

body.

The Focal Plane Shutter has three apertures—one full width of the plate for The Focal Plane Shutter has three apertures—one full width of the plate for slow and medium Focusing purposes; the second, about 1½ inches wide, for slow and medium instantaneous Exposures; and the third one is a narrow slit for High Speed Instantaneous Exposures up to τd_{r00} th second. Outside Indicators and Speed Tablet show at a glance the requisite combination of spring tension and Slit for any given exposure. The great range of speeds from "Time" to $\tau c d_{r00}$ th second render this Camera suitable for any class of subject.

Outfit, See page 187 184

4-Plate

THE THORNTON-PICKARD

"COLLEGE"

A SERVICEABLE & EFFICIENT CAMERA at a very moderate price.



RACKWORK FOCUSSING BODY.

Camera.— Made of beautifully polished Mahogany with best Machine-finished Brass Fittings and Brass Turntable; Extremely Long Extension, with Extending and Swinging Front; Double Stretchers to Camera Back and Front; Brass-lined Fork; Rising and Falling Front; Rackwork Focussing Body Reversing Back etc. etc.

Front; Brass-lined Fork; Rising and Falling Front; mackwork recursing Back, etc., etc.

Body, Reversing Back, etc., etc.

Thornton-Pickard Time and Instantaneous Shutter, Speeds 1, the to 1, the and Time Exposures. Two-fold Stand to fit Turntable, Double Book-form Slide, and Thornton-Pickard Rectoplanat Lens, with Iris Diaphragm.

PRICE LIST.	4-Plate	1 12 Plate	7 × 5 13×18 c'm	Whole-plate
Thornton-Pickard "College" Complete Se as above Specification Do do as above, but wi BECK RAPID SYMMETRICAL LENS, FS.			75/- 85/-	92/6 100/-
Extra Double Book-form Dark Slides, each Good Quality Waterproof Cloth Cas		7/-	8/-	12/-
Pattern 1	2/6	3/6	5/-	5/6
Stiff Waterproof Cloth Case, Pattern L	.4 3/6	5/-	7/-	7/6

2-Plate Outfit, with Thornton-Pickard "Pantoplanat" Lens, 67/6.

THORNTON- TRIBUNE



CAMERA SETS

QUARTER-PLATE SIZE, 41 × 31

Price from

21/-

Five Patterns

Yery suitable for JUYENILES and YOUNG BEGINNERS.

SPECIFICATION of the "TRIBUNE" Outfits.

No. 1. THE GUINEA "TRIBUNE."

Camera.—1-plate size (4½in.×3½in.). Made of selected Mahogany, French Polished. Double Extension. Rack and Pinion focussing from 3½in. to 11in.

Double Stretchers to Back and Front. Reversing Back. Double Swing Back. Rising and Falling Front. Brass Turntable. Two-fold Ash Stand. One Double Bookform Slide. Metal Shutter giving Time Exposures and Variable Instantaneous Speeds. Achromatic Lens with Iris.

No. 1 "TRIBUNE," complete
No. 2 "TRIBUNE." Same as specification No. 1, but with

Double Racks and Pinions, and Sliding Body for use with Short Focus Lenses

No. 3 "TRIBUNE." Exactly as No. 2 Outfit, but fitted with Thornton-Pickard Roller Blind "Snap Shot." Shutter instead of Metal Shutter. Exposures 1/2 in to 30 th sec.

No. 4 "TRIBUNE." Exactly as No. 2 Outfit, but fitted with Thornton-Pickard Roller Blind Time and Instantaneous Shutter. Exposures Jeth to Joth sec., as well as Time Exposures, as illustration

No. 5 "TRIBUNE." Exactly as No. 4, with Thornton-Pickard Time and Instantaneous Shutter and good quality Rapid Rectilinear Lens of splendid covering power and definition instead of Single Achromatic Lens

37/6

Extra Slides, each 5/6. Collapsible Carrying Case I, 2/6. Stiff Case L, 5/6.

"PRAETOR"
CAMERA OUTFIT.

This is an Outfit generally similiar to the "College" not described on page 184, but with Sliding Push-up Body instead of Rackwork Body. It is made in 1-plate size only.

Price

42/-

THORNTON-PICKARD

SPECIAL "OVERSEAS" TEAK PATTERN CAMERAS FOR THE TROPICS.

In response to numerous requests from Colonial and other customers, we have introduced our principal Camera Sets in what will be known as the "OVERSEAS" PATTERN.

Triple Extension

These Cameras are built of Seasoned Toak throughout-a wood expressly selected for its he t and damp-resisting qualities. Every joint is specially strengthened by being screwed as well as glued, and the glue used is of Special Waterproof quality. These Outfits are polished a rich teak colour and present a beautiful and pleasing

The Brassbound "OV RSEAS" Models make ideal outfits for any climate, and will

withstand the most severe atmospheric conditions.

	SETS.						
PATTERN OF CAMERA.	Specification as Standard Outfit on page below.		Plate × 4			1-Plat 8½ × 6	
"ROYAL RUBY"	179, 1A Outfit	£11	15	0	£16	10	0
"PERFECTA"	181, with Beck Lens, F/8	6	0	0	8	17	0
"IMPERIAL"	182, with Beck Lens, F/8	4	15	0	7	7	0
BRASSBINDING Camera "Royal Ruby" "Perfecta" "Imperial"	and Slide—	1 1 1		000	1 1 1	15	
Extra Teak Slides each, "Roya "Perfe" "Brassbo	l Ruby" cta" and Imperial" und, "Royal Ruby" "Perfecta" and	1 0 1	12 7		1 0 1	18	
	"Imperial"	0	16	6	1	2	6
"OVERSEAS" PATTE Made in Teak, Polished all joints.	ern hand and				Brass	bound	at
Pattern of Camera, "OVER	RSEAS " (Teak).	1-	Plat	e.		PC. 12 c/r	
MINISTE POOL DIAME	on page 189	£13	0	0	£1	4 7	6
"FOLDING RUBY"	without Lens.				1		
"FOLDING RUBY" "RUBY REFLEX" Single Extension DUPLEX RUBY" REFLEX Double Extension		1-Pla	0 0	9×12	and c/m.	½-Pl £22	0

without Lens For fullest particulars of "Overseas" Teak Reflex Cameras, and Teak Pattern UNIT" folding Ruby, with Lenses, see complete Catalogue published in January.

on page 196,

16 16 0

24 0

The Thornton-Pickard New 1910 Patent

"UNIT" FOCAL CAMERA SETS

The "ROYAL RUBY," "SPECIAL RUBY," "PERFECTA," and "IMPERIAL" TRIPLE EXTENSION CAMERAS, in both Standard and "Overseas" Models, can all be supplied with the "UNIT" Self-capping Time and Instantaneous Focal Plane Shutter, built in the Camera Body. N.B.—For description of "Overseas" Model see heading page 173.

SPECIFICATION.—In each case the Specification is the same as the Standard Set of each respective pattern and comprises Triple Extension Camera, with Turntable, 3-fold Ash Stand, Double Bookform Dark Slide,

"Unit" Time and Inst. Self-capping Focal Plane Shutter embodied, and Lens as per list below.

-	/			Royal	Per-		
No.	Outfit with Lens.	Series	ens Aperture	Ruby	fecta 2-Plate only	Imp	
1	Thornton-Pickard RUBY ANASTIGMAT Do. "Overseas" (Teak)		F6·8	17 0 0 18 5 0	12 6 6 13 6 6	11 1 6 12 1 6	12 12 6 14 7 6
2 2A	Dalimeyer "STIGMATIC" Do. "Overseas" (Teak)	IV.	F6·3	17 5 0 18 10 0	12 11 6 13 11 6	11 6 6 12 6 6	13 17 6 15 12 6
3 8A	Dailmeyer "STIGMATIC" Do. "Overseas" (Teak)	II.	F6	21 2 6 22 7 6	16 14 0 17 14 0	15 10 0 16 10 0	18 12 6 20 7 6
4 4A	Beck "ISOSTIGMAR" Do. "Overseas" (Teak)	III.	F7.7	15 10 0 16 15 0	10 6 6 11 6 6	9 6 6 10 6 6	11 7 6 13 2 6
5 5A	Beck "ISOSTIGMAR" Do. "Overseas" (Teak)	II.	F5·8	16 12 6 17 17 6	11 10 0 12 10 0	10 9 0 11 9 0	12 7 6 14 2 6
6 6A	Aldis "ANASTIGMAT" Do. "Overseas" (Teak)	III.	F7·7	14 18 0 16 3 0	9 16 6 10 16 6	8 11 6 9 11 6	10 7 6 12 2 6
7 7A	Aldis "ANASTIGMAT" Do. "Overseas" (Teak)	II.	F6	16 17 6 18 2 6	12 4 0 13 4 0	10 19 0 11 19 0	_
8 8A	Ross "HOMOCENTRIC" Do. "Overseas" (Teak)	III.	F6.3	18 10 0 19 15 0	13 16 6 14 16 6	12 11 6 13 11 6	15 2 6 16 17 6
9 9A	Ross "HOMOCENTRIC" Do. "Overseas" (Teak)	II.	F5.6	20 0 0 21 5 0	15 6 6 16 6 6	14 1 6 15 1 6	16 12 6 18 7 6
10 10A	Cooke "ANASTIGMAT" Do. "Overseas" (Teak)	III.	F6.5	18 12 0 19 17 0	13 18 6 14 18 6	12 13 6 13 13 6	14 5 6 16 0 6
11 11A	Cooke "ANASTIGMAT" Do. "Overseas" (Teak)	II.	F4.5	19 12 6 20 17 6	14 19 0 15 19 0	13 15 0 14 18 0	14 15 0 16 10 0
12 · 12A	Goerz "DAGOR"	III.	F6.8	20 5 0 21 10 0	15 11 6 16 11 6	14 6 6 15 6 6	16 17 6 18 12 6
Cam	RASSBOUND Standara and Slide "Overseas	ard a	nd ttern	25/-	25/-	25/-	35/-
	t without Lens			14 0 0 15 5 0	8 15 0 10 10 0	7 5 0 8 5 0	8 10 0 10 5 0
	Shutter Do. do. "Overseas"		" Unit "	12 0 0 13 5 0	8 0 0 8 16 0	6 10 0 7 6 0	7 15 0 9 5 0
	Set, ½-plate only		mera	With "Anastigr	nat F6.8		HOUT Lens



PRACTICAL POINTS POSSESSED BY ALL PATTERNS OF "FOLDING RUBY" CAMERAS.

Rising and Falling Front. Independent Rise and Fall to Camera

Front Panel.

Spring Stretchers to Back and Front. Spring Infinity Catch.

Automatic Spring Catches to Swinging Front.
Triple Extension Bellows, 15 inches

in quarter-plate size. Wide Angle Short Focus Movement. Great Rise at Shortest Focus. Reversing Back for Vertical and Horizontal Pictures.

Spring Snap, automatically securing

Dark Slides in position. Baseboard and Extension Board considerably strengthened by means of Brass Runner Plates.

Spring Focussing Hood folding over Focussing Screen.

Falling Baseboard for use with Short Focus Lenses.

"OMNIFLEX" RISING, FALLING, SWINGING, AND EXTENDING FRONT.

SPECIFICATION AND PRICES, No. 1 "FOLDING RUBY" OUTFIT.

"FOLDING RUBY" HAND CAMERA. with movements as above. Selected Mahogany, beautifully polished internally, with handsome machine-made highly-finished Brass Fittings, covered externally with Real Seal-Crained Morocco Leather, fitted with Leather Carrying Handle and Long Sling Strap.

SHUTTER. New Pattern Bausch & Lomb "AUTOMAT" Between-Lens giving variable Instantaneous Exposures up to 1/100th sec., as well as "Time" and "Bulb" Exposures. Fitted with Pneumatic and Finger Releases.

PLATEHOLDERS. Three Plateholders of new design, with Spring Light Traps

and Aluminium Shutters.

BRICHT FINDER, for Vertical and Horizontal Pictures.

SPIRIT LEVEL. LENS. Beck Rapid Symmetrical, with Iris Diaphragm, 1/8.

£5 5×4 & 9×12c/m £6 0 ¼-Plate ...

Extra Plateholders, each, 1-plate, 5/6; 5×4, 6/6; Waterproof Carrying Case. 1-pl., 7/6; 5x , 8/6; Black Leather Case, 1-pl., 12/6; 5x4, 14/6.



SPECIFICATION. "FOLDING RUBY" No. 2 Model.
"Folding Ruby" Camera with all movements as detailed on previous page. Rack and Pinion Movement to Rising and Falling Front Panel, and Auxiliary Racking Baseboard, for Short Focus Lenses. Other points in Camera as No. 1 Model, but of superior finish generally.

Bausch & Lomb "Automat" Everset Shutter. Speeds Too Seconds, and Time and Bulb Exposures, Bulb and Finger Releases.

Three Double Book-Form Dark Slides, with Rabbetted Hinged Shutters, and Hinged Metal Division, made of best Mahogany, black polished to match Camera, and fitted with Patent Exposure Recorders.

Best Brilliant Finder for Vertical and Horizontal Pictures. Spirit

Beck Double "Aplanat" Convertible Lens, F. 7.7 with Iris.

 5×4 and 9×12 c/m. Postcard Size Half plate 1-plate size £10 10 £6 10 0 £7 10 0 £8 10 0

"FOLDING RUBY," No. 3. Model De Luxe.

SPECIFICATION .- Same general Specification as No. 2 Outfit above, but Camera fitted with Universal Swing Back and Revolving instead of Reversing Back, which allows slide to be changed from ver ical to horizontal, or vice versa when in position. Bausch & Lomb "Automat" Shutter, Three Double Bookform Slides, Bright Finder, Spirit Level, and Beck Double "Aplanat" Convertible Lens, F7.7.

† Plate £8. 0. 0. 5 × 4 £9. 0. 0.									
Extras for "Folding-Ruby" Hand Cameras.	1	PLAT	E.	5× 9×	4 ar 12 c/	m.	1/2-	PLA	Œ.
Extra Book Form Double Dark Slides	0	10	0	0 .	11	0	0	12	6
Plateholders	0	7	6	0	8	6	0	12	6
Black Leather Case for Camera and three Plate-	0								0
Telescopic Hand Camera Stand, No. 2, Height 48in. Time Exposure Valve to Shutter	0	3	6	0	3	6		3	6
Mackenzie-Wishart Patent Loading Daylight Slide Envelopes for Ditto									0
Film Pack Adapter, including fitting			6		_			_	

THE THORNTON-PICKARD NEW

FOCAL PLANE FOLDING RUBY HAND CAMERAS

The No. 2a.

This Camera has all the features of the No. 2 pattern with the further great advantage of a

FOCAL PLANE SHUTTER

built in the Camera Body. This Focal Plane Shutter has three permanently fixed apertures, and for the various speeds all adjustment is obtained by simply turning a Spring Tension Knob. The No. 2a Folding Ruby Camera will give



Exposures up to 1/1000th of a second. as well as Time Exposures and ordinary Instantaneous Speeds, given by the Between-Lens Shutter on the Camera Front.

No. 2a FOCAL PLANE "FOLDING RUBY" Specification.

"FOLDING RUBY" Camera with all movements as No. 2 pattern, on page 189, and with Three-aperture Focal Plane Shutter embodied, giving exposures from 1/25th to 1/1000th of a "econd".

BAUSCH & LOMB "AUTOMAT" SHUTTER, Three Double Bookform slides with Exposure Recorders, Brilliant Finder, Spirit Level, and Lens as per list.

No.	OUTFIT WITH LENS.		ens.	14-	plat	te	5× 9×	4a1	nd m	Po 5	Car Car	d.	3-1	plai	te
1	With Beck Convertible Aplanat, Standard Set	_	F7.7		15		-		_		0	_		5	-
3	With Ruby Anastigmat		F6.8	11	7	6	12	17	6	13	17	8	16	10	
5	With Beck Isostigmar	II	F5.8	10	2	6	11	15	0	12	7	6	15	7	
8	With Ross Homocentric	ш	F6.3	12	2	6	13	17	6	14	17	6	18	0	Ī

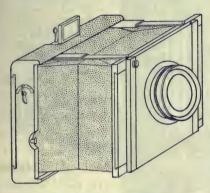
FOLDING RUBY HAND CAMERA.

This Outfit is exactly the same as the above but the "UNIT" Self-capping Focal Plane Shutter, as described on pages 174 and 175, is embodied, and as this Shutter also gives Time Exposures, the "Automat" Shutter is not supplied.

"UNIT" Focal Plane Folding Ruby Outfit without Lens £10 0 0 £11 7 6
Do. with T.P. Ruby Anastigmat F6'8 ... 1215 0 14 7 6
Do. with Dallmeyer Stigmatic IV, F6'3 ... 1210 0 14 7 6
Do. do. do. II, F6 ... 15 5 0 1712 6

The THORNTON-PICKARD
New Patent

'UNITA' Collapsible Hand Camera.



EMBODIES THE WORLD'S SIMPLEST AND MOST PERFECT FOCAL PLANE SHUTTER.

RANGE OF SPEEDS 3 Seconds to 1/1000th.

150/-

Fitted with the Patent

"UNIT" SELF-CAPPING TIME and INSTANTANEOUS FOCAL PLANE SHUTTER.

Pneumatic and Finger Releases, Rising and Falling Front, Cross Front, Anastigmat Lens in Focussing Mount.

QUICKLY ERECTED, INSTANTLY CLOSED.

Extremely Portable and Compact.

Fits easily in the coat pocket.

Usable as a Hand & Stand Camera.

A convenient and Simple Camera for every phase of work, including High-speed, Photography of moving objects.

THE PRESSMAN'S IDEAL.

The notable point of difference between the new "Unita" Camera and the rairous makes of Collapsible Cameras already on the market, is that the "Unita" is fitted with the Thornton-Pickard Patent "Unit" Self-capping Time and Instantaneous Focal Plane Shutter, as described in detail on pages 174 and 175. This fact alone makes the "Unita" preferable to all other Cameras of similar type. It is superior to all others both for simplicity and efficiency. One and the same turn of the Winding Key perferms the necessary operations for the correct working of the "Unit" Focal.

SPECIFICATION.—Quarter-Plate (44 by 34) "Unit" Camera, with Mahogany Body, leather-covered, and with ebony polished Front and Back. Strong self-locking Steel Struts, fixing camera absolutely rigid. Square Morocco Leather Bellows. "Unit" Self-capping Time and Inst. Focal Plane Shutter embodied. Pneumatic and Trigger Releases. Rising, Falling, and Cross Front. Three Double Dark Slides, ebony polished, to match Camera. Direct Vision Finder with Magnifier, and including Leather Carrying Case.

Outfit as above without Lens

With Thornton-Pickard Ruby Anastigmat F6.8 Lens in Focussing Mount.

Do. Dallmeyer Stigmatic, Series IV. F6.3 do.

Do. do.

Do. Gooke Anastigmat do. III. F6.5 do.

11 0 0
11 6 6

THE THORNTON-PICKARD GENUINE BRITISH-MADE

SUNBEAM NEW 1910 PATTERN



ROLL FILM

HAND CAMERA

MODEL A. Fitted with IMPROVED AUTOMATIC FOCUSSING STOP

adjustable for

VARYING DISTANCES.

PRICE from

Quarter-plate and Postcard sizes.

For use with

DAYLIGHT LOADING

Roll Films. Can also be used with

GLASS PLATES

by special adaptation of Camera Back.

SPECIFICATION.

Camera.-Best well-seasoned Mahogany, with Aluminium Baseboard, and Best Nickelled Fittings. Covered in Best Black Seal-grained Leather. Fitted with all necessary movements, including Rising, Falling, and Cross Front.

Automatic Spring Stretchers. Camera Front Clamp. Self-detaching Spring

Back, and Improved Spoolholder. Tripod Bushes.

Real Leather Bellows.

Infinity Catch.-Automatically Locks the Front on Extension at "infinity" focus. (Model A fitted with Improved Auto. Focussing Stop for varying distances)

Engraved Focussing Scale, with Pointer for objects nearer than infinity.

Lens.—Beck Rapid Symmetrical, with Iris F8.
Finder.—Combined Brilliant Reversible Swivel Finder and Spirit Level.

Shutter .- New Pattern Bausch & Lomb "Automat" Everset Between-Lens, giving variable Instantaneous Speeds of $\frac{1}{25}$, $\frac{1}{100}$, and $\frac{1}{1000}$ sec. Automatic Exposures of 1, $\frac{1}{2}$, and $\frac{1}{5}$ sec. Also "Time" and "Bulb." Pneumatic and Trigger Releases.

		1-Plate			Postcard				
"Sunbeam" Camera, MODEL "A" as above Specification, for films only Do. do. with Back adapted for both films and plates	£3	10		£4 4	4	0			
"Sunbeam" Camera, MODEL B" as above Specification, but with Double Extension Bellows, Rack and Pinion Focussing, and Screw Arm Adjustment to Rising and Falling Front	4	10	0	5	10	0			
Ground Glass Focussing Screen and three Single Metal Slides for Plates, per Set, in suitable case	0	9	0	0	12	6			
Telescopic Stand, 48in. open, 16in. closed, Round Brass	0	9	0	0	9	0			



Dimensions: $8\frac{11}{16}$ " × 4" × 1" Weight, $1\frac{1}{4}$ lbs.

IMPROVED AUTOMATIC STOP FOCUSSING

Varying Distances

fitted to Pattern A.

Made in Quarter-plate and Postcard sizes, and in two patterns.

An ideal and dainty "Snap Shot" Camera of the greatest utility.

BEST

BRITISH BUILT. THICKNESS WHEN CLOSED...

about 1 inch.

SPECIFICATION. Model A.

Camera.—Body, Baseboard, and Front constructed of Aluminium, and neatly covered with Fine-grained Best Quality Black Morocco Leather. All Inside Fittings beautifully nickelled and finished in first-class style. Provided with all necessary movements, including Rising and Falling Front, Cross Front to right and left, with Automatic Central Locking Device. Automatic Spring Stretchers, locking Camera Body in true perpendicular. Grooved Slide

Rails for Extension of Front. Instantaneous Clamp to Front, &c.

Infinity Catch.—Automatically locks the Front on extension at infinity focus.

(Improved Automatic Focussing Ston for varying distances fitted to Pattern A.)

Engraved Focussing Scale, with Pointer for objects near to Camera.

Engraved Focussing Scale, with Pointer for objects near to Camera.

Cround Class Focussing Screen, for using Camera on Stand, for which purpose Bushes are provided. Real Leather Bellows.

Shutter.—T.-P " Eclipse" Automatic Between Lens, giving variable Instanspeeds of \$\frac{1}{25}\$, \$\frac{1}{25}\$, and \$\frac{1}{25}\$ sec., also "Time" and Bulb Exposures, Pneumatic and Finger Releases.

Lens.—T.-P. Beck Double Rapidplanat, with Iris Diaphragm, F 7.5.

Slides.—Extra Thin Single Metal Slide, Draw-out Shutters, and Plush Light Trap.

Finder.—Combined Brilliant Reversible Swivel Finder and Spirit Level.

"Wafer" Camera, Model A., as above, with two Single Metal Slides, quarter plate size ... "Water "Camera, Model B., as above, but with Double Extension Bellows, Rack and Pinion Focussing, and Mechanical Transverse Action Rising and Falling Front actuated by Milled Head, Swing Back, and Time Exposure Valve to Shutter for additional Automatic Exposures of A. J. 1. 2. and 3 seconds ... Extra Single Metal Slides, each ... Time Exposure Valve to Shutter of Model "A" Camera Telescopic Stand, 48in. open, 16in. closed, Round Brass Tubes

Solid Black Leather Case for Camera and six Slides .

_ ;	-P	late	Postcard.							
3	2	15	0	£3	0	0				
	4	4	0	4	10	0				
	-	-	•			•				
-	0		6	0	2 5	_				

1-PLATE.

25/-

THE THORNTON-PICKARD

"WEENIE"

HAND CAMERA.



Dimensions closed: $5\frac{1}{4} \times 4\frac{1}{2} \times 1\frac{7}{8}$. Weight, 19ozs.

An Extremely Compact and Attractive

POCKET

For use with Plates.

An Efficient Apparatus, of small bulk, light weight, and great practical con-

Quarter-Plate Size.

venience. :: ::

MADE IN FOUR

SPECIFICATION.

Camera.—Body and Baseboard of good seasoned Mahogany, covered in best fine-grained Morocco Leatherette. Brass Fittings, beautifully burnished and lacquered. Real Leather Bellows. Focussing Scale. Infinity Catch. Rising and Falling Front. Ground Glass Focussing Screen, &c.

Lens.—Rapid Achroplanat, with Iris Diaphragm. Fs.

Shutter.—T.-P. "Eclipse," giving Time, Bulb, and Variable Instantaneous Exposures of Arth. Arth and Aroth of a second. Pneumatic and Finger Releases.

Reversible View Finder, for vertical and horizontal.

Slides.—Two Single Metal Slides, with Plush Light Traps.

Tripod Bushes for Vertical and Horizontal Pictures.

Extra Single Metal Slides. 1/6 each. Carrying Case Waterproof Canvas 2/6

Extra Single Metal Slides, 1/6 each. Carrying Case, Waterproof Canvas, 2/6.

Brass Tubular Tripod, 3-draw, 6/6. Tan Mail Carrying Case, 2/6.

Price from

THE THORNTON-PICKARD NEW

SAFET



Carries 12 Plates in Sheaths.

14-PLATE SIZE.

Made in 11 PATTERNS.

Series I, I'A, and Model de Luxe.

An admirable Camera for "Snap Shot" work. Free from complication. Simple working.

SPECIFICATION. No. 1 "SAFETY" MAGAZINE HAND CAMERA.

Camera made of well-seasoned hard wood, and covered with Black SealGrained Leatherette, with Nickelled Fittings. Hinged Front Door for
cleaning Lens and Finders. Inside Lens Board, Camera Sides, and Back
of Front Door beautifully polished. Hinged Back Door to Magazine
Chamber, with supplementary door for removal of exposed plates. Perfect
Changing Arrangement of the greatest reliability. Automatic Numerator.

Shutter.— "Everset" Between Lens Shutter for Time, Bulb, and variable Instantaneous Exposures, with Pneumatic and Trigger Releases.

Lens.—Thornton-Pickard Achropianat, a single Lens, giving brilliant definition,

and capable of producing good sharp pictures.

Portrait Attachment.-For focussing objects nearer than infinity. Finders.—Two, for vertical and horizontal, Brilliant pattern, showing image right way up.

Tripod Bushes, fitted for vertical and horizontal pictures when used on Stand.

No. 1 "SAFETY" MACAZINE CAMERA.

Quarter-plate Size, as above specified

No. 3 "SAFETY" MACAZINE CAMERA.
Same specification as No. 1, but with Racking Focussing
Arrangement for objects nearer the Camera than infinity, with

Engraved Focussing Scale

"Koilos" Shutter, 15/- extra; Bausch & Lomb "Automat," 7/6, in all cases.

For other patterns of "Safety" Camera see complete Catalogue published in January

ENTIRELY NEW 1910 PATTERN.

THORNTON-PICKARD Patent

and

ROYAL RUB

SELF-CAPPING TIME and INST.

FOCAL PLANE SHUTTER SELF-SETTING MIRROR.

}-Plate Size, Without Lens,





ADVANTAGEOUS PRACTICAL POINTS.

Double-Acting

on a Tripod.

15 10 0

Mirror taneous v.

both

"UNIT" Time and Instantaneous Self-Capping Focal Plane Shutter (see pages 174 and 175), with adjustments operated from the outside by one Single turn of

the Winding Key, givin:—
Time Exposures of any duration. Instantaneous Exposures up to

1/1000th of a second. Outside Speed and Slit Indicators.

Speed Calculating Tablet. Long Detachable Focussing Hood. Rack and Pinion Focussing.

Detachable Camera Front Panel.

Self-Locking Revolving Back, for vertical and horizontal pictures. Long Extension.

Everset Silver-surfaced Mirror, working without vibration during exposure. Noise reduced to the minimum.

pecial Locking Device for securing mirror out of way when using Camera

Release, actuating and Shutter simul-

"Omnifiex" Rising, Falling, Swing-ing, and Extending Front, &c.

SPECIFICATION.—"Royal Ruby" Reflex Camera, with features and movements as above enumerated, with Patented "Unit" Self-Capping Time and Inst. Focal Plane Shutter embodied, three Double Patent Plateholders and Sling Strap, without Lens.

1-Plate, £12. 12. 0. | 5×4, Postcard, £18. 0. 0. | 1-Plate, £24. 0. 0. and 9×12 c/m.

"ROYAL RUBY" REFLEX CAMERA, as above. Ruby Anastigmat Lens. F6.8 Dallmeyer Stigmatic, F6.3, Series IV. ...

1-Plate. 5 × 4 & P.c. 3-Plate. £20 15 0 £27 10 0 £15 10 0 20 15 0

"OVERSEAS" (TEAK) PATIERN REFLEX CAMERAS. See page 186.

Ouarter-Plate

without Lens

REFLEX

Size

"RUBY" NEW 1910 MODEL

REFLEX
Fitted with the

Fitted with the World's Simplest and Most Efficient Shutter,

viz.: the

"UNIT" TIME AND INSTANTANEOUS

Self-Capping

FOCAL PLANE

as fully described on pages 174 and 175.

ONE AND THE SAME TURN

of the Winding Key shown in the accompanying illustration performs the necessary operations for efficiently working the Shutter. 70

effect so much quite half-a - dozen adjustments are necessary in most other Reflex Cameras.

The "Ruby" Reflex is also fitted with

EVERSET MIRROR,

which automatically returns to the "set" position after each exposure.

SPECIFICATION.

"Ruby Reflex" Camera, of specially selected well-seasoned Mahegany, covered with finest Morocco leather, with Outside Fittings oxydised or leather covered; "Unit" Self-Capping Focal Plane Time and Inst. Shutter; Long Focussing Hood; Three Double Plateholders; and all points above enumerated.

N.B.—The "Duplex Ruby" is fitted with REVOLVING in place of Reversing Back.

170/With "Ruby" Anastigmat, F6.8
£11 10 0
THORNTONPICKARD

NOTABLE PRACTICAL POINTS OF THE NEW "RUBY" REFLEX.

"Unit" Focal Plane Time and instantaneous Self-capping Shutter, operated by one turn of Winding Key.

of Winding Key.

Ever et Mirror always ready.

Mirror Silvered on surface, thus
preventing Double Reflections.

Ful-sized Image seen up to the moment of exposure.

Long focussing Hood for easy focussing.

Hood Detachable so as to clean mirror and ground glass. Reversing Back for Vertical or

Horizontal Pictures.

Rising and Falling Front.
Detachable Lens Carrier Casket,
entirely recessed in Camera
Front with Hinged Spring Nky
Shade. forming a perfect
protection for the Len«.

PRICES WITHOUT LENS. 3-Plate. 3-Plate. & 9×12 c/m. "RUBY" REFLEX. Single Extension
"DUPLEX RUBY," REFLEX Double do.
WINT "AUBY" Anastigmat F6.8 Lens.
"RUBY" REFLEX. Single Extension
"DUPLEX RUBY," REFLEX Double do. Single Extension £8 10 0 £12 12 £16 16 10 10 15 15 0 20 0 Single Extension 20 10 13 10 0 18 10 0 23 10

For other Anastigmat Lenses with Reflex Cameras, see complete Catalogue, FOR TEAK "OVERSEAS" PATTERN "RUBY" REFLEX, see page 186.

THE THORNTON-PICKARD

NIMROD AUTOMAN'



Upon pressure of the Sprin Catch on the top of the Camera Body the baseboard falls down, and th Front automatically erect at the infinity focus point ready for work, as depicted in the accompanying illustration.

Patterns of the "Nimro Automan" Cameras are fitted wit every convenient feature for ease i actual practice, including: Rack and Pinion

> Focussing for nearer objects. Rising and Falling Front.

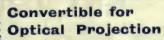
Reversing Back, Spring Focussing Hood with Ground Glas Screen, Countersunk Brilliant Finder with Sky Shade, Engrave Focussing Scale with Pointer, Tripod Bush fitted in Camer Body for use on Stand, and REAL LEATHER BELLOWS.

SPECIFICATIONS AND PRICES.		1-Pla	te		and /m.	
and covered with best quality Waterproof Morocco- grained Leatherette, Brass Fittings. machine-made, highly finished and lacquered. With all movements above specified. Between Lens Shutter for Time and variable Instantaneous exposures, with Pneumatic and		3s.	0d.	£3	15s.	Od.
with Double Exte sion Baseboard and Bellows, Two Racks						
"NIMROD AUTOMAN" No. 3 MODEL DE LUXE. Double Extension Camera and Bellows, with two Racks and Pinions, as Model No. 2, but fitted in addition with Central Universal Swing Back, Extra Back Extension, giving longer Foous, and Spirit Level. Covered with Real Seal-grained Morocco Leather. Fitted with						
Extra Plateholders, each Portable Telescopic Stand, 48 inches closing to 16 inches long Black Leather Carrying Case for Camera and Three Plateholders		5/- 9/-			6/- 9/-	
	"NIMROD AUTOMAN" No. 1. Camera made of mahogany, beautifully polished inside and covered with best quality Waterproof Moroccograined Leatherette, Brass Fittings. machine-made, highly finished and lacquered. With all movements above specified. Between Lens Shutter for Time and variable Instantaneous exposures, with Pneumatic and Trigger Releases, one Double Platcholder, and TP. RECTOPLANAT Lens, F8 "NIMROD AUTOMAN" No. 2. Outlit exactly as No. 1, specified above, but Camera with Double Exte sion Baseboard and Bellows, Two Racks and Plnions, and TP. "SUNBEAM" Shutter, having a greater range of Instantaneous Exposures than Shutter of No. 1 Model. Speeds Tooth up to 3 seconds. "NIMROD AUTOMAN" No. 3 MODEL DE LUXE. Double Extension Camera and Bellows, with two Racks and Pinions, as Model No. 2, but fitted in addition with Cantral Universal Swing Back, Extra Back Extension, giving longer Focus, and Spirit Level. Covered with Real Seal-grained Morocco Leather. Fitted with BECK RAPID SYMMETRICAL LENS F8, instead of Rectoplanat. Other points as No. 2 Outfit Extra Platcholders, each Portable Telescopic Stand, 48 inches closing to 16 inches long	"NIMROD AUTOMAN" No. 1. Camera made of mahogany, heautifully polished inside and covered with best quality Waterproof Moroccograined Leatherette, Brass Fittings. machine-made, highly finished and lacquered. With all movements above specified. Between Lens Shutter for Time and variable Instantaneous exposures, with Pneumatic and Trigger Releases, one Double Platcholder, and TP. RECTOPLANAT Lens, F8 "NIMROD AUTOMAN" No. 2. Outlit exactly as No. 1, specified above, but Camera with Double Exte sion Baseboard and Bellows, Two Racks and Plnions, and TP. "SUNBEAM" Shutter, having a greater range of Instantaneous Exposures than Shutter of No. 1 Model. Speeds right up to 3 seconds. "NIMROD AUTOMAN" No. 3 MODEL DE LUXE. Double Extension Camera and Bellows, with two Racks and Pinions, as Model No. 2, but fitted in addition with Central Universal Swing Back, Extra Back Extension, gliving longer Focus, and Spirit Level. Covered with Real Seal-grained Morocco Leather. Fitted with BECK RAPID SYMMETRICAL LENS F5, instead of Rectoplanat. Other points as No. 2 Outfit Extra Platcholders, each Portable Telescopic Stand, 48 inches closing to 16 inches long.	"NIMROD AUTOMAN" No. 1. Camera made of mahogany, beautifully polished inside and covered with best quality Waterproof Moroccograined Leatherette, Brass fittings. machine-made, highly finished and lacquered. With all movements above specified. Between Lens Shutter for Time and variable Instantaneous exposures, with Pneumatic and Trigger Releases, one Double Plateholder, and TP. RECTOPLANAT Lens, F8 "NIMROD AUTOMAN" No. 2. Outlit exactly as No. 1, specified above, but Camera with Double fixe sion Baseboard and Bellows, Two Racks and Plnions, and TP. "SUNBEAM" Shutter, having a greater range of Instantaneous Exposures than Shutter of No. 1 Model. Speeds root hu to 3 seconds. "NIMROD AUTOMAN" No. 3 MODEL DE LUXE. Double Extension Camera and Bellows, with two Racks and Pinions, as Model No. 2, but fitted in addition with Central Universal Swing Back, Extra Back Extension, giving longer focus, and Spirit Level. Covered with Real Scal-grained Morocco Leather. Fitted with BECK RAPID SYMMETRICAL LENS F8, instead of Rectoplanat. Other points as No. 2 Outlit Extra Plateholders, each Portable Telescopic Stand, 48 inches closing to 16 inches long.	"NIMROD AUTOMAN" No. 1. Camera made of mahogany, heautifully polished inside and covered with best quality Waterproof Moroccograined Leatherette, Brass Fittings. machine-made, highly finished and lacquered. With all movements above specified. Between Lens Shutter for Time and variable Instantaneous exposures, with Pneumatic and Trigger Releases, one Double Platcholder, and TP. E3 3s. Od. "NIMROD AUTOMAN" No. 2. Outlit exactly as No. 1, specified above, but Camera with Double Exte sion Baseboard and Bellows, Two Racks and Plnions, and TP. "SUNBEAM" Shutter, having a greater range of Instantaneous Exposures than Shutter of No. 1 Model. Speeds rooth up to 3 seconds. "NIMROD AUTOMAN" No. 3 MODEL DE LUXE. Double Extension Camera and Bellows, with two Racks and Pinions, as Model No. 2, but fitted in addition with Central Universal Swing Back, Extra Back Extension, giving longer Focus, and Spirit Level. Covered with Real Seal-grained Morocco Leather. Fitted with BECK RAPID SYMMETRICAL LENS F8, instead of Rectoplanat. Other points as No. 2 Outfit Extra Platcholders, each Portable Telescopic Stand, 48 inches closing to 16 inches long.	"NIMROD AUTOMAN" No. 1. Camera made of mahogany, heautifully polished inside and covered with best quality Waterproof Moroccograined Leatherette, Brass Fittings. machine-made, highly finished and lacquered. With all movements above specified. Between Lens Shutter for Time and variable Instantaneous exposures, with Pneumatic and Trigger Releases, one Double Platsholder, and TP. E3 3s. 0d. "NIMROD AUTOMAN" No. 2. Outlit exactly as No. 1, specified above, but Camera with Double Exte sion Baseboard and Bellows, Two Racks and Pinions, and TP. "SUNBEAM" Shutter, having a greater range of Instantaneous Exposures than Shutter of No. 1 Model. Speeds rooth up to 3 seconds. "NIMROD AUTOMAN" No. 3 MODEL DE LUXE. Double Extension Camera and Bellows, with two Racks and Pinions, as Model No. 2, but fitted in addition with Cantral Universal Swing Back, Extra Back Extension, giving longer focus, and Spirit Level. Covered with Real Scal-grained Morocco Leather. Fitted with BECK RAPID SYMMETRICAL LENS FS, instead of Rectoplanat. Other points as No. 2 Outfit Extra Plateholders, each Portable Telescopic Stand, 48 inches closing to 16 inches long.	"NIMROD AUTOMAN" No. 1. Camera made of mahogany, beautifully polished inside and covered with best quality Waterproof Moroccograined Leatherette, Brass Fittings. machine-made, highly finished and lacquered. With all movements above specified. Between Lens Shutter for Time and variable Instantaneous exposures, with Pneumatic and Trigger Releases, one Double Platcholder, and TP. RECTOPLANAT Lens, F8 "NIMROD AUTOMAN" No. 2. Outlit exactly as No. 1, specified above, but Camera with Double Exte sion Baseboard and Bellows, Two Racks and Plnions, and TP. "SUNBEAM" Shutter, having a greater range of Instantaneous Exposures than Shutter of No. 1 Model. Speeds rooth up to 3 seconds. "NIMROD AUTOMAN" No. 3 MODEL DE LUXE. Double Extension Camera and Bellows, with two Racks and Pinions, as Model No. 2, but fitted in addition with Central Universal Swing Back, Extra Back Extension, giving longer focus, and Spirit Level. Covered with Real Seal-grained Morocco Leather. Fitted with BECK RAPID SYMMETRICAL LENS F8, instead of Rectoplanat. Other points as No. 2 Outfit Extra Platcholders, each Portable Telescopic Stand, 48 inches closing to 16 inches long.

SPECIAL PATTERN 5×4 FOCAL PLANE AUTOMAN. £6 6s. Od.

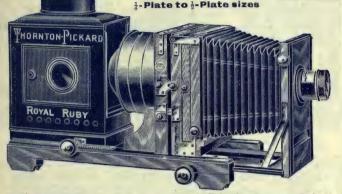
THE THORNTON-PICKARD NEW

"ROYAL RUBY" ENLARGER



210/-

Enlarger Complete.



The "ROYAL RUBY" is our latest production in Enlarging Cameras. It is of an entirely new design, and is the most superb Enlarging Camera it is possible to obtain.

SPECIAL FEATURES of the "ROYAL RUBY" ENLARGER

Extremely Long Extension with Rack and Pinion.

Rack and Pinion Movement of Lantern for adjusting light.

RISING and FALLING CARRIER for centreing any portion of negative with the light, with Rack and Pinion.

Rack and Pinion Rising and Falling Front, with Automatic Lock. REVOLVING CARRIER, with Rack and Pinion, for placing negative in any position. Brass Grooved Carrier Stage SWINGING CARRIER BODY,

SWINGING CARRIER BODY, with Rack and Pinion, for correcting distortion in Negative.

Detachable Bellows for Science

Camera Body brassbound suitable for any climate.

SPECIFICATION.—Camera and all Woodwork of best seasoned mahogany, beautifully french polished, with Brassbound Body. Russian Iron Lantern with Cowl, Cones, and Rims of polished copper. Specially selected Plano Convex Condenser in Oxydised Brass Mount. Fine quality Portrait Lens in Black and Brass Mount, with Iris and Orange Glass Cap.

-Plate with 8 in. Condenser and Portrait Lens .. 14 10

OPTICAL PROJECTION REQUIREMENTS.

4in, Bi-Convex and Meniscus Condenser with Adapter to fit Enlarger Body

Lantern Slide Carrier Adapting Frame, and "Merito"
Lantern Slide Dissolving Carrier.

1-plate 5×4 & P.C. 25/-

1-plate 30/-



MADE IN FOUR PATTERNS and in

-- PLATE

 5×4 and 4-PLATE

SIZES. For use with Gas, Oil, Elec-tric, or Lime-

light.

These Enlargers are known as the "Ruby" Enlargers, and their special advantages may be summarised briefly as follows:-

REAL LEATHER BELLOWS.

Rack and Pinion Focussing exactly like a Camera.

Rack and Pinion Operated from both sides.

Perfect Rigidity of Condenser Body Solid Strengthening Brackets.

Lantern Body Sliding on Mahogany Platform.

Triple Extension Collapsible Lighttight Tubes.

PATENT CENTRAL SWING

to Negative Carrier Stage for correcting distortion in vertical lines.

RACK and PINION TILTING CARRIER STAGE.

giving side motion to negative for rectifying horizontal lines when out of straight. Russian Iron Lantern of Sound

and Substantial Construction. Strengthened with Corrugations.

SPECIFICATION. PATTERN A. (as illustrated).

Camera made of beautifully polished Mahogany, fitted with Rising Front, Swing Body, Negative Holder, and other features as above enumerated.

Square Pattern Russian Iron Lantern Body, with Oval Cowl, Sliding Back Door, and Light-tight Hinged Side Door, with Ruby Glass Window, Tray

and Rod for Illuminant Fittings.

Condenser.—Specially selected Plano Convex in Solid Mount.

Lens.—Rapid Portrait in Solid Black and Brass Mount, with Rack Pinion, Iris
Diaphragms, and Orange Glass Cap.

4-Plate, &4 O O. 5 × 4 and Postcard. &5 O O. 2-12-Plate. &7 O O.

PATTERN C .-

Same specification as Pattern A., but with Vertical Lantern Body, with ong Hopper Chimney. Fitted complete with Incandescent Fittings or Duplex Lamp.

1-Plate, £4 0 0. 5 x 4 and Postcard, £5 0 0. 1-Plate. £7 0 0.

PATTERN B.

Lantern Body, Base, and Stage, with Tray and Rod for Light Fittings, as in Pattern A., but this pattern is for use with Customer's own Lens and Camera, and is therefore supplied without Extending Front, Bellows, Rack and Pinion, and Lens.
2-Plate. £2 15 0. | 5 × 4 and Postcard, £3 10 0. |

3-Plate, £5 5 PATTERN D.-

Same as Pattern B., but with Vertical Lantern Body, with Long Hopper Chimney, and Incandescent Fittings or Duplex Lamp.

1-Plate, &2 15 0. | 5 × 4 and Postcard, &3 10 0. | 1-Plate, &5 5 0.

A descriptive Booklet entitled "ENLARGEMENTS: Lantern Slides and Projection," is sent post free by THORNTON-PICKARD, Ltd., ALTRINCHAM.

NEW INTRODUCTION.

THE THORNTON- "UNEEKA."



For Enlarging from Negatives 3½in, × 2½in. and Smaller. Equally suitable for the Projection of Lantern Slides.

The Ideal Enlarging Apparatus for Photographers using 3½in. × 2½in. and Smaller Cameras.

Brilliant Enlargements up to any

size obtainable.

Enlarger suitable for making Lantern Slides.

Suitable by projection of Lantern Slides by simply substituting Lantern Slide Carrier for Negative Carrier.

- A Perfect Enlarger.
- A Perfect Optical Projection Lantern.

PRICE,

Complete as per Specification.

£5. 0. 0.

Stained Wood Travelling Case . . 7/6
Stiff Waterproof Cloth Case, with

Lock Solid Leather Case, with Lock

.. 20/k .. 40/-

SPECIFICATION.

All Woodwork is of Mahogany, French Polished.

Rising and Falling Front.

Rack and Pinion Swinging Carrier Stage.

Rack and Pinion Tilting Carrier Stage.

Detachable Condenser Body.

Detachable Leather Bellows for Science Projection.

Negative Carrier.

"Merito" Dissolving Lantern Slide

Spring Carrier Stage, Adjusting Register of both Lantern Slide and Negative Carrier.

Russian Iron Lantern.

Bi-Convex and Meniscus Condenser.

Portrait Lens of High Quality, in Black and Brass Mount, for Enlarging and Projection. PRICE LIST OF THORNTON-PICKARD CAMERAS, &c.

-/06

THE	BRITISH JOURNAL ALMANAO ADVERTISEMENTS
12 × 10 and 24×30 c/m.	1115 8 111 8 111 8 111 8 111 8 111 8 111 8 111 8 11 8 1 8
10 × 8 and 18×24 c/m.	1112
Whole- Plate 8 × 64	1108 8. 1118 8. 1118 8. 1118 8. 1118 8. 1118 8. 1118 8. 1118 8. 1118 8. 1118 8. 1118 8. 118 8
7½ × 5 and 13×18 c/m.	28. d.
Half-Plate	6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
5 × 4 and 9 × 12 c/m.	20 20 20 20 20 20 20 20 20 20 20 20 20 2
Quarter- Plate 34 × 44	8. d. 118 6 0 15 0 0 15 0 0 0 15 0 0 0 0 0 0 0 0 0
Size of Plate in inches.	HEROYAL RUBY. TRIPLE EXTENSION Brasshiding to either of above "SPECIAL RUBY." Brasshound "IMPERIAL." TRIPLE EXTENSION O. OVERSEAS." pattern Brasshiding to either of above "PREFECTA." COCHEGE." "COLLEGE." "PREFIG." "O. Do. "COLLEGE." "PREFIG."





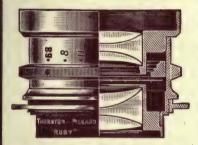
Exposure i second. Prize Picture.

STUDY OF A GLACIER. (Kashmir Himalayas)

Mrs. H. H. HART.

Taken with the Thornton-Pickard "Royal Ruby" Camera, fitted with
Time and Inst. Shutter, and T.-P. R.R. Lens. Shutter
fitted with Patent Time Exposure Valve.

*RUBY ANASTIGMAT"



is a Perfect Modern Anastigmat of the Highest Class, at Popular Prices. Critical Definition all over the Plate at full aperture, F6.8.

In view of the fact that there are now such large numbers of both British and foreign-made Anastigmat Lenses on the market, it becomes increasingly difficult for the photographer to select a suitable Lens of really good value. Under these circumstances we would draw the attention of users of Photographic Lenses to the above illustrated "Ruby Anastigmat" Lense.

This Lens is, when required, fitted to all the Cameras of our manufacture, and when bought in conjunction with any of our "Ruby" or "Royal Ruby" Cameras, forms part of an Outfit which stands unrivalled for thorough efficiency in operation and perfect design and finish.

Thornton-Pickard "RUBY ANASTIGMAT."

The NEW THORNTON-PICKARD "RUBY ANASTIGMAT" is a Lens of the high-class Anastigmat type and of the finest quality. It is a Lens for universal work, has a large working aperture of F6.8, at which aperture the plate is sharply covered to the extreme edges. For definition, brilliancy, and flatness of field, no lens at the price can equal it. It is suitable alike for Portraits, Groups, ordinary Snap Shot, and High Speed Instantaneous Work, and, in fact, for every class of subject. Though considerably lower in price, it is quite the equal of many of the higher-priced Anastigmats on the market, and is strongly recommended.

The prices for this Lens and the approximate foci of the various sizes are given below.

	E OF PL		Description.	Equiv. Focus, inches.	Full Aperture		ICE d.
4½ × 3½ 5 × 4 6½ × 4¾ 7½ × 5 8½ × 6½ 10 × 8	6½ × 4¾ 8 × 5 8½ × 6½ ! 8½ × 6½ 10 × 8 12 × 10	8½ × 6½ 10 × 8	91 11	5 6 7½ 8 9½ 10	F 6.8 F 6.8 F 6.8 F 6.8 F 6.8	3 1 4 4 1 6	0 0

Photographers' opinions on the Thornton-Pickard "Ruby Anastigmat" Lens:

I use a "Perfecta" with "Ruby" Anastigmat Lens. I have found the Outfit equal to any demand. The Lens is most excellent.—R. M. S.

All to whom I have shown the Outfit have been surprised at its excellence. I am specially pleased with the Ruby Lens.—J. T.

CARRYING CASES

BEST QUALITY,

For THORNTON-PICKARD and other Cameras.







PATTERN A.

PATTERN D.

PATTERN C.

Patterns A and B are Waterproof Cloth Cases, Leather Bound, with Collapsible sides and Loose division, lined with Green Baize, and fitted with Snap Lock and Key, and Shoulder Strap.

A To hold Camera, three Slides, Shutter, Lens, Focussing Cloth, &c.

B To hold three extra Slides only.

Pattern H is a strong Waterproof Cloth Case, Leather Bound, to hold Tripod Stand.

Patterns C and D are Strong Waterproof Cloth Cases, Leather

Bound, with Stiff Sides and Fast Division Lined with Green Baize, and fitted with Snap Lock and Key, Handle and Shoulder Strap, which may also be used Knapsack fashion.

C To hold Cameras, three Slides, Shutter, Lens, Focussing Cloth, &c.

D To hold Camera, six Slides. Shutter, and accessories; or Camera with Lens attached in situ, five Slides, Shutter, and accessories; or Stereoscopic Camera, five Slides, Shutter, and accessories.

LEATHER CASES.

Patterns F and G are best portmanteau finish Leather Cases, built on internal steel framing. They hold respectively same as Waterproof Cloth Cases C and D.

Sizes and Prices.		4	1×	31		5×	4	6	1×	ią.	1	73×	5	8	3×	61	1	0×	8	12>	(10
Pattern A Waterproof Clo Pattern B "Pattern C""" Pattern D """" Pattern F Solid Leather" Pattern H Stand Case	••	0 0 1	7 5 14 17 5 0 7 3	66060006	000120	8 6 15 19 10 5 7 3		00011200	9 7 16 0 15 15 7 4	66000000	00012200	11 8 18 2 0 17 7	66000600	00112300	13 9 0 4 5 10 7 4	5800000		16 12 3 8 10 15 9 5	000000	1 8 1 18 4 10 6 0	6 0

SECOND QUALITY.

Our second quality Cases are substantial and serviceable, and much lower in price. Patterns J, K, and N correspond respectively to cases A, C, and D as regards their carrying capacity, and Pattern O to Leather Case F.

Sizes and Prices.	4½×3½	5×4 & 9×12 c/m.	6½×4½	7½×5 & 13×18 c/m	83×63		
Pattern J	••	0 4 6 0 7 0 0 12 0 0 4 5	0 5 0 0 7 6 0 12 6 0 4 6	9 5 6 9 9 0 0 13 6 0 4 6 0 17 6	0 6 6 0 10 6 0 14 6 0 4 6	0 7 0 0 11 6 1 0 0 0 5 0 1 7 6	

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SPECIAL SENSITIVE

250-275 H. & D. Only slightly less sensitive than the Flashlight, but with the same general characteristics. The most popular professional Plate in the World.

SPECIAL RAPID

200-225 H. & D. An old-established favourite for studio and outdoor photography. For exquisite results, combined with absolute freedom from fog and rich gradation, this Plate leaves nothing to be desired.

SOVEREIGN

150-180 H. & D. A rapid brand, very popular with outdoor workers. Great latitude in exposures, yielding perfect negatives, even when greatly under or over exposed. An ideal Plate for stand cameras.

ORDINARY

80-100 H. & D. These Plates are of moderate speed, easy to manipulate, and noted for their fineness of grain and rich density. Give bright and clean negatives with splendid gradation.

FINE-GRAIN ORDINARY

40-50 H. & D. The outstanding feature of this Plate is its very fine grain, which renders it suitable for copying or making enlarged negatives.

LANDSCAPE

30-40 H. & D. Similar to the Fine-Grain Ordinary, but of lower speed, Yield sparkling negatives with a good deal of contrast.

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10-15 H. & D. Specially manufactured for process-workers and others requiring a Plate capable of giving strong contrasts. They possess an exceedingly fine grain and give wonderfully clean, bright results. These Plates are also suitable for making positives or transparencies.

SPECIAL

These Plates give brilliant results. Free from fog, and with abundant detail in the shadows.

ORTHOCHROME PLATES.

SPECIAL SENSITIVE

SPEED 275 H. & D. The fastest Ortho. Plate in the world; much used for rapid exposures in studio and outdoor. Perfect rendering of colours when used with Imperial Light-Filter.

SPECIAL RAPID

200 H. & D. Similar to the S.S., but not so rapid.

N.-F. (Non-Filter) 175 H. & D. As the name indicates, this Plate will give full orthochromatic results without a Light-Filter. It is the only Plate of its kind, and is as easy to work and as certain in its results as other Imperial brands.

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41	×	-3	1	6	1	0	0	3	8.3 × 8.3	1	3	1 0	0	3
5	×	4	2	6	1	7	0	4	8.5×8.5	1	3	1 0	0	3
51/2	×	$3\frac{1}{2}$	2	6	1	7	0	4	8.3 × 10.7	1	6	1 0	0	3
6	×	4	2	9	1	10	0	4	8.5 × 17	2	10	1 10	0	4
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81	×	61	6	6	4	3	0	9	16 × 21	6	6	2 8 4 3	0	9
9	×	7	7	6	5	0	1	0	18×21 18×24	8	0	5 0	1	0
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24	×	20	88	0	59	0	5	0	50 × 60	88	0	59 0	5	0
24	×	20	88	0	59	0	5	0	50 × 60	38	0	59 0	5	0

ALL OTHER SIZES AT PROPORTIONATE PRICES.

Imperial backing (anti-halo) is an entirely new substance. It is an absolute preventive of halation; it will not powder off, and, being perfectly soluble, need not be washed off before developing.

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ORTHOCHROME PLATES.

Imperial Ortho Special Sensitive.

(H. and D. 275.)

Imperial Ortho Special Rapid.

(H. and D. 200.)

These plates are the result of careful study and exhaustive experimenting, and we claim that they are the most perfect colour sensitive plates at present made. That they meet with general favour is evidenced by the large and rapidly increasing sales. They have now taken the foremost place amongst colour correct plates.

The two varieties differ only in speed; the "Ortho S.R." being 200 H. and D., while the "Ortho S.S." are 275 H. and D., the latter being the fastest Ortho plate in the world.

Imperial N.-F. (Non-Filter) Plates.

(H. and D. 175-200.)

We have no hesitation in putting these plates forward as an absolutely unique production. A dye in the film exercises a screening action on the light so that colour correct results are obtained, without the aid of a light filter.

Imperial Ortho plates do not need any special manipulation during any of the operations, but may be used in exactly the same manner as any other Imperial brand. They allow great latitude in exposure, develop easily, and give bright, sparkling, well-graded negatives. The colour in the film discharges itself in the washing water and leaves no stain behind.

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Without an equal for printing from any type of negative. Tones easily, without double tones, to any desired colour between red-brown and rich purple. Retains all the delicate detail in the high-lights, while the shadows remain transparent.

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BROMIDE (Matt) In two varieties—ROUGH and SMOOTH. Easy to manipulate. For pure whites and rich blacks it is unequalled, but other colours can be obtained by suitable treatment. Must be handled in the dark-room.

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Specially adjusted to suit Imperial Orthochrome Plates. Give the utmost correction with the least possible increase in exposure.

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A little instrument by means of which the intensity of the light is measured and the exposure fixed for every aperture of the lens and every speed of plate. It is simple, cheap, and durable, and is absolutely accurate. The Meter may be carried in the waistcoat pocket.



Price, bound in leather cloth, I/-. Post free I/I (including sensitized paper).

Extra sensitized paper, 3d. per dozen pieces (sufficient for 150 exposures).

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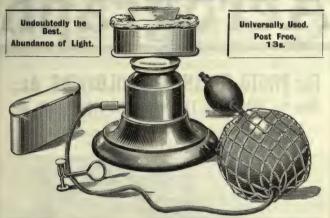
With this instrument it is 'not necessary to actually measure the intensity of the light; a simple table is given, and by moving two slides the correct exposure is simultaneously shown for every aperture of the lens. All conditions of weather and plate speed are provided for as well as every subject from "Clouds" to "Very Dark Interiors."



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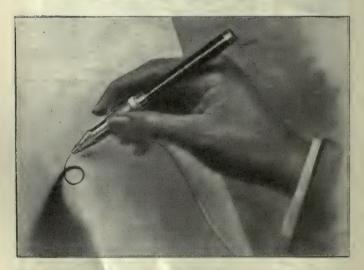
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SERIES.	6	Focus.	Plate covered sharply at Full		rice IRIS	3	cr	orrespor ombina ease fo	ne of ding front tion to in- ocal length			
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	13	7.7	$6\frac{1}{2}\times4\frac{3}{4}$	5	0	0)	ANGL	.E 85°.			

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MAWSON'S "GLADIATOR" DRY PLATE.

The MOST RAPID Plate. Speed, 550.

From W. H. L., February, 1909:-

"Astounded at results. The 'GLADIATOR' is just the Plate I have been wanting for years."

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THE "GLADIATOR" EXTRA SPECIAL RAPID.

Popular Prices $\frac{1}{4}$, 1/-; $\frac{1}{2}$, 2/3; $\frac{1}{1}$, 4/3; $\frac{19}{10}$, 10/6.

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can be used WITH or WITHOUT a Light Filter.
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WITHIN A FRACTION OF A SECOND.

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MORGAN'S SYSTEM OF DRY MOUNTING PLATE MARKING AND NAMING WITHOUT TISSUE AT ONE PRESSURE.



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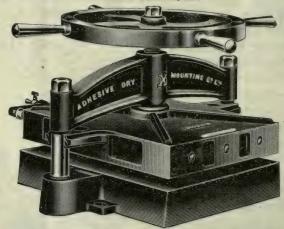
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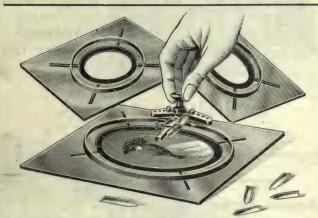
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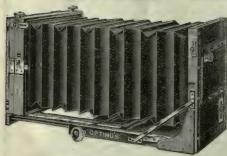
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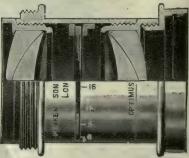
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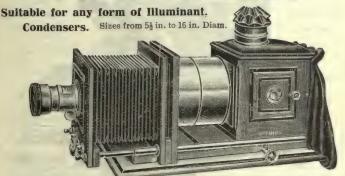
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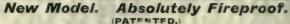
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The solutions greatly simplify the working of this process, as all the solutions are of uniform concentration, requiring to be diluted with ten times their bulk of water. They are prepared from the Lumière formulæ. The uniform amount of dilution required for each bath facilitates enormously the ease of working and prevents errors. The complete set of solutions in 5-oz. stoppered bottles, sufficient for about two dozen ½-plates, 7/- All the solutions will keep for several months in opened bottles, and indefinitely in unopened (full) bottles.

HINTON & CO. supply every requisite for Colour Photography, and advice

and specimens of the processes are at the service of our clients.

"KUPOL."

THE NEW AND MOST EFFICIENT TONING FOR BROMIDE PRINTS.

Yields splendid Sepia and Brown Tones, retaining the Whites in their original purity, or rendering them in a fine Pale Cream Crayon Tint as desired.

EXTREMELY ECONOMICAL IN USE.

"KUPOL" is entirely new, and distinctly superior to any other Bromide Toner. Bromides may be toned at any time after fixing and washing, and if it is required to tone them before drying a ten minutes' thorough wash will suffice, as "KUPOL" will effectually destroy the last traces of Hypo. The Solutions are highly concentrated and will keep indefinitely.

FULL DIRECTIONS ENCLOSED.

Price per Set, making 34 ozs. of each Bath, 1/6; Post free, 1/11.

Telegraphic Address—
"SENSITIZE, LONDON."

Telephone No.—

7931 CENTRAL.



19]0

PRICE LIST

WELLINGTON

PLATES PAPERS FILMS

WELLINGTON & WARD, ELSTREE, HERTS.

H



The

"WELLINGTON"



Made in Ten Varieties. . .





Wellington & Ward, Elstree, Herts. . .

Telegrams: "Wellington,

Boreham Wood."

Telephone: Elstree 92.





The

"WELLINGTON"

PLATES.



Made in Ten Varieties. . .







Plates.

Made in the following varieties:	H. & D. Speed No.	Watkins Speed No.	Wynne Speed No.
'XTRA SPEEDY (Ultra Rapid The fastest of all fast plates. Indispensable to the specialist in focal-plane shutter work the naturalist photographer, the photo graphing of dark interiors, and in fact for all work requiring the minimum of exposure under adverse conditions.	; ;	300	f/III
(SPECIAL) 'XTRA SPEEDY (Ultra Rapid) For portraiture by artificial light. Practically the same plate as the 'Xtra Speedy, with the exception that it gives the softest of results thus counteracting the hardness which artificial light has a natural tendency to produce, and ensuring a more pleasing effect	- 350	300	f/III
'XTRA SPEEDY PRESS (Ultra Rapid) An ideal negative medium of extreme rapidity Manufactured expressly to meet the require ments of press photographers. Two specia features are the extra density which i obtained in a normal space of time and the rapidity with which the plate fixes, thu enabling the press photographer to obtai a print ready for half-tone reproduction in an exceedingly short space of time.	il s e s	300	f/III
SPEEDY (Special Rapid) A medium speed plate for general all-round instantaneous photography. One of the best negative mediums for record and survey.	t y	220	f/90

N.B.—Carefully note when ordering to state the number of PACKETS required, otherwise confusion is liable to occur when the word dozens is used.

work, interior and exterior architectural studies, photomicrography, telephotography,

etc.

SPECIAL SIZES CUT TO ORDER.

NOTE.—All varieties of "WELLINGTON" Plates, in addition to possessing general quality throughout, are world-jamous for their freedom from fog, fineness of grain and gradation, and ease in manipulation.

Plates.

2 1000	000		
	H. & D. Speed No.	Watkins Speed No.	Wynne Speed No.
SPEEDY PORTRAIT (Special Rapid)	250	220	f/90
The up-to-date studio plate, yielding an image of sparkling brilliancy, with no harshness or loss of detail. Especially suited for the best rendering of the delicate gradations in portrait work.			
ISO SPEEDY (Extra Rapid) -	225	200	f/78
Isochromatic. Specially sensitive to yellow and green, thus effecting a remarkable improvement in the rendering of tone and colour values. In conjunction with the WELLINGTON 5-times light filter, this plate makes an ideal combination.			
ORDINARY	125	100	f/64
For general field work. Especially suitable for copying purposes and the making of enlarged positives or negatives.			-, -, -
ORTHO PROCESS	80	65	f/47
Photo-Mechanical. An excellent plate for the process engraver in line and half-tone. A special feature is the better rendering of tone and colour values. Also exceedingly useful for copying purposes and the making of enlarged positives or negatives.			
LANTERN PLATE	5		
For lantern slides and transparencies by contact or reduction. Yielding rich blacks, beautifully clean and bright.			
S.C.P. LANTERN PLATE			
(Gaslight)			
For lantern slides and transparencies by contact or by reduction. A fine range of pure tones from black to red obtainable by simple			

N.B.—Carefully note when ordering to state the number of PACKETS required, otherwise confusion is liable to occur when the word dozens is used.

exposure and development. No after-toning

process is necessary.

SPECIAL SIZES CUT TO ORDER.

NOTE.—All varieties of "WELLINGTON" Plates, in addition to possessing general quality throughou', are world-famous for their freedom from fog, fineness of grain and gradation, and ease in manipulation.

Plates.

					SIZES	and P	RICES.				
Inch		-3		manlink	of - dom	n plates				S.	d. 6
25			per	раскег	of I doze	en plates	• •	• •	• •	0	
22	×	21/2		F 2	1.1	9.9	• •	• •		0	9
$3\frac{1}{2}$	×	22		3 3	1.2	2.1		• •		0	.9
34	×	34		9.9	,,	11	* *		• •	0	10
31/2	×	32		9.9	9.9	9.9		• •	• •	1	0
44	×	34		9.7	1.1	11				1	0
5	×	4		2.7	2.1	9 9				1	7
51/2	×	31		1.1	9.4	9.9				1	7
5 1 6 2 6 2	×	35		9.9	9,9	9.9		• •		1	7
	×	31		2.2	11					1	10
61	×	44		1.7	11	11				2	2
61	×	44		11		9.9				2	3
7	×	5		9.1	,,	2 2				3	0
$\frac{7\frac{1}{2}}{8}$	×	5		9.9		9.9				3	5 9 3 3
	×	5			1 *	11				3	9
81	×	$6\frac{1}{2}$		9.1		4.9				4	3
10	×	8		9.7	**	9.9				7	
12	X	10		, ,		* *				10	6
15	×	12		,,		,,				18	0
18	X	16		9.7		7.9				32	6
20	X	16		17	, ,	* *				36	0
24	X	20		,,	, ,	**				59	0
31	×	31	Lan	tern Pl	ate, per p	acket of I	dozen plat	es		1	0
31	×	31	S:C	.P. Lar	itern Plat	e ,,	"			1	0
Lan	ter	n S	lide	Cover	Glasses,	Specially		per o	dozen	0	6
,			11		11	"	**	per	gross	5	6
				than S	izan ta a		partionate				

Other Sizes to order at proportionate prices.

All grades	of "W	ELLI	NGTO					backed	at	uniform	charges
					dozen						
1-plate,	3 d.		5 × 4,	4d.		3-F	olate,	6 d		$8\frac{1}{2}\times6$, 9 d.
2 4	IOX8	. 1/0		12	XIO	. 1/6		I5X	12	. 2/0	

CONTINENTAL SIZES and PRICES.

	Trifffe fre					S.	(1.
6	× 9	per packet of	I doze	en plates	 	 0	9
9	XI2	11	2.1	11		 1	4
12	$\times 16\frac{1}{2}$	1 1	1.1	* *	 	 2	3
13	\times 18	11	1.2	1	 	 2	8
18	× 24	11	1.1	11	 	 5	0
21	× 27	+1		11	 	 7	8
24	× 30	11	, ,	,,	 	 10	0
30	× 40	11	1.7	1 2	 	 20	0
40	X 50	11		* *	 	 34	0
50	\times 60	1.7	, ,	.,	 	 55	0



· WATALU?

Self-Developing Plate

POINTS:

Water only required for Development.

Stock solutions of expensive developing agents dispensed with.

Non-Halative for all ordinary subjects, owing to the compound with which the back of the plate is coated. This backing contains all necessary chemicals to form an efficient developer, which gradually dissolves as development proceeds.

Admirably suited to Stand or Tank Development.

Made in the following Grad	les:	H. & D. Speed No.		Watkins Speed No.	5-	Wynne
'XTRA SPEEDY		350	_	-	-	f/III
SPEEDY -	- -	250	-	220	-	f/90
ISO SPEEDY -		225	-	200	-	f/78
ORDINARY -		125	_	100	-	f/64

Water only required for Development.

(See next page).

· WATALU?

Self-Developing Plate

Made in the follo	wing G	rades:			itkins Wed No. Spe	
'XTRA SPEEDY	7 -	_	350	-	300 -	f/III
SPEEDY			250		220	f/90
						1-1
ISO SPEEDY	-	-	- 225	1	200	f/78
ORDINARY -	-	-	- I25	-]	00 -	f/64
	OVER	ANID	DRIODE			
Inches.	SIZES	AND	PRICES.			s. d.
$2\frac{5}{16} \times 1\frac{3}{4}$					per dozen	0 8
$2\frac{1}{2}$ \times $2\frac{1}{2}$					1.7	0 11
$3\frac{1}{2} \times 2\frac{1}{2} \cdots$ $3\frac{1}{4} \times 3\frac{1}{4} \cdots$					• •	0 11
$3\frac{1}{4} \times 3\frac{1}{4} \times 3\frac{1}{4} \cdots$	• •				* *	1 3
5 × 4 · · ·					, ,	2 0
$5\frac{1}{2} \times 3\frac{1}{4} \cdots$,,	2 0
$5\frac{1}{2} \times 3\frac{1}{2} \cdots$					++	2 0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			• •		**	2 4 2 10
7 × 5					.,	3 9
7½ × 5 ···						4 3
8 × 5					* *	4 8
$8\frac{1}{2} \times 6\frac{1}{2}$						5 4
10 × 8			• •		, 1	9 1 13 2
15 × 12						22 6
CONTIN	ENTAL	SIZE	S AND	PRIC	ES.	
Centimetres.					per dozen	s. d.
9 × 12		414			,,	1 8
$12 \times 16\frac{1}{2}$					* *	2 10
13 × 18	• •				11	3 4 6 3
18 × 24	• •	• •		• •	11	6 3 9 7
24 × 30			• • •		,,	12 6
30 × 40						25 0
40 ×5c		* *			11	42 6
50 × 60	• •	• •	• •		10	68 9

'WELLINGTON' Anti-Curling

IN DAYLIGHT CARTRIDGES FOR ALL DAYLIGHT CAMERAS.

Celluloid Roll Films.

Description for Ordering (Width of Film).	Size of Picture. Inches.	6 Exposures.	Exposures.
1½ in	1½×2		1/3
ış in.	$1\frac{5}{8} \times 2\frac{1}{2}$	7 d.	1/2
21 in. A	21×21	7d.	_
21 in. B	21×31	10 d.	_
2½ in. C	2½×3½ 2½×7	11d. (3 Exps.)	1/9 (6 Exps.)
21 in.	2½×4½	1/3	2/6
3½ in.	$3\frac{1}{4} \times 4\frac{1}{4}$ $3\frac{1}{4} \times 6\frac{1}{2}$	1/6 (3 Exps.)	3/0 (6 Exps.)
3½ in. A	3½×5½	1/9	(10 Exps.) 3/0
3½ in. B	3½×4½	1/6	3/0
3½ in. C	3½×5½	1/9	(10 Exps.) 3/0
$3\frac{1}{2}$ in.	$3\frac{1}{2} \times 3\frac{1}{2}$ $3\frac{1}{2} \times 7$ $3\frac{1}{2} \times 9$, &c.	1/3 (3 Exps.) (2 Exps.)	2/6 (6 Exps.) (5 Exps.)
4 in.	4 × .5 4 × 10, &c. 4 × 12	1/11 (3 Exps.) (2 Exps.)	3/9 (6 Exps.) (5 Exps.)
4 in. A	4 × 5	1/11	3/9
41 in	4½ × 3½	1/6	3/0
44 in. A	4½×6½	2/9	_
5 in.	5 × 4 5 × 12, &c. 5 × 16, &c.	1/11 (2 Exps.) (1 Exp.)	3/9 (4 Exps.) (3 Exps.)
7 in.	7 × 5 7 × 15 7 × 21	3/4 (2 Exps.) (1 Exp.)	6/8 (4 Exps.) (2 Exps.)

_		,	1 1	,	1 /	t
"WEL			Celluloid	Cut	Films	(Anti- Curling).
	Cut Sheet	s.				s. d.
$3\frac{1}{2} \times 2\frac{1}{2}$ per	packet of	1 dozen				1 4
44×34	11	**				1 9
5 × 4		* *				2 9
$6\frac{3}{4} \times 3\frac{1}{4}$,	1	• •			3 0
$6\frac{1}{2} \times 4\frac{3}{4}$		**	• •	• •		4 0
7½×5	+ 1	1.7			• •	5 0
82 × 65	1 .	1.7		• •	· · ·	7 0
					(See nex	t page).



Anti-Curling

Celluloid Roll Films.

Isochromatic.

DAYLIGHT ROLL HOLDER SPOOLS.

3½ in. R.H.	34×44	12 Exps. 3/0
44 in. R.H.	44×34	3/0
4 in. R.H.	4 ×5	3/9
5 in. R.H.	5 ×4	3/9
6½ in. R.H.	$6\frac{1}{2} \times 4\frac{3}{4}$	6/0
7 in. R.H.	7 ×5	6/8

NOTE.—If Six Exposures in Roll Holder Films are required, these are charged half-price, plus 1d.

The "WELLINGTON" 5-times Light Filter, for use in conjunction with the "WELLINGTON" Iso Speedy and Ortho Process Plates, and Anti-Curling Celluloid Isochromatic Roll Films.

No.	I, for lenses	ı in. to 13 in.	 	 10/6
No	2	13 in. to 15 in.	 	 12/6

The "WELLINGTON" Exposure Disc, for determining in a few seconds the exposure necessary for any given subject, under any condition of lighting, at any time of the year. 9d.



Bromide Paper.

Made in the following Grades at Uniform Prices:

Platino-Matt Surface-

SMOOTH, ROUGH, SPECIAL THICK, 'XTRA ROUGH, CREAM CRAYON 'XTRA ROUGH, CREAM CRAYON THIN SMOOTH & SPECIAL SMOOTH.

Ordinary Surface— SMOOTH, ROUGH & CREAM CRAYON ROUGH.

Carbon Surface—(Smooth) Thin & Thick.

Canvas Surface—THE NEW GRADE, with a delightful CREAM & WHITE.

Also ENAMMO: A Glossy Surface Bromide Paper.

ROSE, WHITE, MAUVE & CONTRASTY WHITE.

Special Thick—Mauve and Rose only.

For the winter months, when it is next to impossible to secure a print on P.O.P., we have placed in the photographer's hands a paper possessing the advantages of both P.O.P. and Bromide in one, i.e., ENAMMO. It is manipulated in the same manner as our Platino-Bromide, and possessing as it does, nearly the same rapidity the two papers may be worked side by side. If desired, the image may be toned to a sepia.

(For Prices and Sizes see next page).

Prices and Sizes

of

Bromide & Enammo Papers.

			s. d.	1			s. d.
28×13	30 sheets	() 6	$8\frac{1}{2} \times 6\frac{1}{2}$	12 sheets		2 0
21×21	20 ,,	() 6	10 × 8	12 ,,		2 9
$3\frac{1}{2} \times 2\frac{1}{2}$	16 ,,	() 6	12 × 10	3 ,,		1 1
$3\frac{1}{2}\times2\frac{1}{2}$	32 ,,	1	0	12 X 10	6 ,,		2 2
$3\frac{1}{4} \times 3\frac{1}{4}$	15 ,.	(6	12 × 10	12 ,,		4 2
$3\frac{1}{4} \times 3\frac{1}{4}$	30 ,,	1	1 0	123×103	3 ,,		1 2
$3\frac{1}{2} \times 3\frac{1}{2}$	14 ,,	(0 6	12 × 10 1	6 ,,		2 4
$3\frac{1}{2} \times 3\frac{1}{2}$	28 ,.		1 0	$12\frac{1}{2} \times 10\frac{1}{2}$	12 ,,		4 6
$4\frac{1}{4} \times 2\frac{1}{2}$	15 .,		0 6	13 × 4	12 ,,		2 0
$4\frac{1}{4} \times 2\frac{1}{2}$	30 ,,		1 0	15 × 12	3 ,, .		1 8
$4\frac{1}{4} \times 3\frac{1}{4}$	12 ,,		0 6	15 × 12	6 ,,		3 3
$4\frac{1}{4} \times 3\frac{1}{4}$	24 ,,		1 0	15 × 12	12 ,,		6 3
5 × 4	0		0 6	151×121	3 ,,		1 9
5 × 4	-8		1 0	153×125	6		3 6
$5\frac{1}{2} \times 3\frac{1}{2}$	0		0 6	$15\frac{1}{2} \times 12\frac{1}{2}$	T.O.		6 9
	- Q		1 0	18 × 15	2	• •	2 9
5½×3½ 5¾×4			6 .	18 × 15	6	• •	5 0
	7 ,,		1 0		7.0		9 6
54×4	14 ,,		0 6	18 × 15 20 × 16		• •	3 0
6 × 41	7		1 0		3 ,,	• •	
$6 \times 4\frac{1}{4}$	14 ,,			20 × 16		• •	5 9
$6\frac{1}{2} \times 4\frac{8}{4}$	6 ,,			20 × 16	12 ,,	• •	11 0
$6\frac{1}{2} \times 4\frac{3}{4}$	12 ,,		1 0	23 × 17	3 ' 11	• •	3 6
$7\frac{1}{2} \times 2\frac{1}{2}$	9 ,,		6	23 × 17	6 ,,		6 9
$7\frac{1}{2} \times 2\frac{1}{2}$	18 ,,		0	23 × 17	12 ,,	• •	12 6
7½×5	12 ,,		1 3	25 × 21	3 ,,		5 0
$6\frac{1}{2} \times 6\frac{1}{2}$	12 ,,		1 6	25 ×2I	6 ,,	* *	9 6
8 × 6	12 ,,	••,	1 9	25 × 21	12 ,,	• •	18 0

BROMIDE POST-CARDS.

(Matt, Glossy & Carbon).

RE	GULAT	ION SI	ZE		
Packet of	8 card	ls		s. 0	d.
	18 ,,			1	0
	14 ,,			7	6
,, I,00	00 ,,			52	0
	Court	Size-	-	c	d

Packet of 12 cards..

25 FEET ROLLS.

				S.	a.
15 incl	nes wide			13	3
20	**			17	6
22	* *			20	0
25	9.0	c +		22	0
30	11			26	6
40	* *			35	0
Boxes.	r Gross	144 sh	eets)		
		• •	,	10	0
Boxes.	& Gross	(72 she	eets)	8	0



Registered Trade Mark.

Slow Contact Paper Gaslight Development.





Made in Fifteen Grades:

For brilliant prints from weak negatives-

MATT, GLOSSY, ART WHITE, ART TINTED, PORCELAINE, THICK GLOSSY & THICK MATT.

For soft prints from plucky negatives-

PORTRAIT MATT, PORTRAIT GLOSSY, SEMI-MATT AND PORTRAIT CARBON.

For prints of superb vigour-CARBON (Thin & Thick). For pictorial effects CANVAS SUPFACE Cream & White

Lor bici	Olidi	enec	13	WIA A W.O.	SURFA	JE-CIE	am e	White.		
					PRICES.				S.	d.
28 × 13	30 S	heets							0	6
$2\frac{1}{2}\times2\frac{1}{2}$	20	2.7							0	6
$3\frac{1}{2} \times 2\frac{1}{2}$	16	2.5							0	6
$3\frac{1}{2} \times 2\frac{1}{2}$	32	1.1					8 41		1	0
$3\frac{1}{4} \times 3\frac{1}{4}$	15	2.1							0	6
$3\frac{1}{4} \times 3\frac{1}{4}$	30	> 2							1	0
$3\frac{1}{2} \times 3\frac{1}{2}$	14	2.2						• •	0	6
$3\frac{1}{2} \times 3\frac{1}{2}$	28	2.2							1	0
44×21	15	9.2							0	6
41×21	30	2.2							1	0
44×34	12	2.3							0	6
44×34	24							• •	1	0
5 × 4	9	, ,							0	6
5 × 4	18	1.1							1	0
$5\frac{1}{2} \times 3\frac{1}{2}$	9	9 9							0	6
$5\frac{1}{2} \times 3\frac{1}{2}$	18	2.2		• •					1	0
								(See next	page	e)

ml v al	0.0	hoote						0	6
$7\frac{1}{2} \times 2\frac{1}{2}$	-	heets	*. *		* * *				
$7\frac{1}{2} \times 2\frac{1}{2}$	18	1.9						1	0
$5\frac{3}{4} \times 4$	7	2.5			• • • • •			0	6
5 ³ / ₄ × 4	14	1						1	0
$6 \times 4\frac{1}{4}$	7	,,						0	6
$6 \times 4\frac{1}{4}$	14							1	0
$6\frac{1}{5} \times 4\frac{3}{4}$	6							0	6
61× 43	12	,,						1	0
	12	,,			••			1	3
7½× 5		,		• •		• •	• •	1	6
$6\frac{1}{2} \times 6\frac{1}{2}$	12	1.5			• •				
8 × 6	12	, .						1	9
$8\frac{1}{2} \times 6\frac{1}{2}$	12 .	1.1						2	0
13 × 4	12	,						2	0
10 × 8	12	.,						2	9
12 × 10	3	,						1	1
12 × 10	6							2	2
12 × 10	12	,						4	2
123×103							• •	1	2
	3	13						2	4
123 × 103	6	1						_	
$12\frac{1}{2} \times 10\frac{1}{2}$	12	1.5						4	6
15 × 12	3	1.0	* *					1	8
15 × 12	6	3.5						3	3
15 × 12	12	2.1						6	3
158×128	3	1.2						1	9
15 × 12 1	6							3	6
15 × 12 1	12	**	• •		• •			6	9
		2.2		• •		• •	• •		0
18 × 15	3	7.7					• •	2	9
18 × 15 18 × 15	3 6		• •		• •	• •	• •	2 5	0
18 × 15 18 × 15 18 × 15	3 6 12	7.7	• • • • • • • • • • • • • • • • • • • •			• • • • • • • • • • • • • • • • • • • •	• •	2 5 9	0
18 × 15 18 × 15	3 6 12 3	,,				• •		2 5 9 3	0 6 0
18 × 15 18 × 15 18 × 15	3 6 12	;; ;;		• •		• •	• • • • • • • • • • • • • • • • • • • •	2 5 9	0 6 0 9
18 × 15 18 × 15 18 × 15 20 × 16	3 6 12 3)))))))))))))))))))			••			2 5 9 3	0 6 0
18 × 15 18 × 15 18 × 15 20 × 16 20 × 16 20 × 16	3 6 12 3 6 12	77 23 24 29 12		• • • • • • • • • • • • • • • • • • • •	••	••		2 5 9 3 5	0 6 0 9
18 × 15 18 × 15 18 × 15 20 × 16 20 × 16 20 × 16 23 × 17	3 6 12 3 6 12 3	22 23 24 24 24 22 24 27			••	••		2 5 9 3 5 11 3	0 6 0 9 0 6
18 × 15 18 × 15 18 × 15 20 × 16 20 × 16 20 × 16 23 × 17 23 × 17	3 6 12 3 6 12 3 6	22 22 22 22 22 22 21 22 21			••	••		2 5 9 3 5 11 3 6	0 6 0 9 0 6 9
18 × 15 18 × 15 18 × 15 20 × 16 20 × 16 20 × 16 23 × 17 23 × 17 23 × 17	3 6 12 3 6 12 3 6	22 22 21 22 22 12 21 21 21			••	••		2 5 9 3 5 11 3 6 12	0 6 0 9 0 6 9 6
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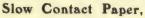


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9	×	12	 12	11			 	 0	9
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13	×	18	 12	11			 	 1	3
18	×	24	 12				 	 2	5
24			 12	,,			 	 -	0

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CARBON: The New Grade, with a beautiful surface.

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Inches.	PRICES:	s. d.	Inches.		PRICES:	s. d.
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$3\frac{1}{2} \times 2\frac{1}{2}$,,	28 ,,	0 6	$6 \times 4\frac{1}{4}$	1.7	12 ,,	0 6
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	Prices of	application	111.	
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C-de-V.	38×21		1	8
.,	35 × 25		1	10
Cabinets	51×4		4	8
.,	5\\\ \\ \\ \\		5	0
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Made in Three Grades:-GLOSSY MAUVE, MATT WHITE and CARBON.

ROLLS, 25 ft. × 35 ins. 18s.

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One Bath only—HYPO
Beautiful Rich tones.

Made in Four Grades:—

Made in Four Grades:—

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CONTINENTAL SIZES AND PRICES.

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Centimetres.	Sheets.	s. d.	Centimetres.	Sheets.	S.	d.	Centimetres.	Sheets.	S.	d.
61×9	38	1 0	9×12	22	1	0	18×24	5	1	0
9 ×9	28	1 0	12×161	12	1	0	24 X 30	6	2	0
			13×18	10	1	0	, ,			
9 × 9	28	1 0				0		6	1	2

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C-de-V. 31×21	 2	9	Cabinets 5\frac{3}{4} \times 4 \qquad	8	0
			Size 8 × 6		
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Half-Tone from a print on WELLINGTON Carbon Bromide.









We claim the Adams MINEX to be the greatest advance ever made in Reflex Camera construction. Its simplicity of manipulation is astonishing.

No other camera in the world possesses the following remarkable features:

1. The Adams Revolving Back automatically masks picture upon top focussing screen. The drawback to a square screen is, that the operator may think he is taking a vertical picture, but his back may be horizontal, or vice versa. In MINEX if vertical picture is seen, revolving back must be in correct position for taking it. Error is impossible. Composing picture is much easier with mask, but fact of viewing mask and revolving back working in conjunction is of greatest practical value.

2. Adams Patent Self-Capping Focal Plane Shutter fitted. Speeds 1000th to

3 seconds, also time and bulb.

Three-quarters of a turn of shutter knob sets shutter also mirror! Old methods of separate movements are now superseded by our new simplified system of a single quick movement.

4. No restrictions in setting speeds with shutter. May be instantaneously set whilst shutter is in any position, and are always correctly indicated, whether

shutter is set or not.

5. Shutter and mirror released from single release, on all speeds, whether

instantaneous, time, or bulb. Never accomplished before!

6. Only one movement required to change from time, bulb, or instantaneous speeds. Mirror does not have to be separately thrown out of action. An entirely new simplified movement.

7. Extra ground glass focussing screen for back of camera, also three double dark

slides are all carried self-contained inside the camera.

8. New mirror system, entirely free from vibration.

9. Patent four-ways swing front.

10. Handle on top. More convenient for carrying and holding. Handles on side are extremely inconvenient, especially when camera is carried and hood open.

11. Magnifying Spectacle Lenses fitted inside hood. Do not have to be carried separately.

DAMS & Co., 24 Charing Cross Road, LONDON, W.C.

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The Adams MINEX

Needs but little introduction. For seven years the Adams VIDEX has held an unparalleled reputation, and has stood for all that was best in Reflex Instruments, and was everywhere acknowledged to be the standard Reflex Camera of the world. When first placed upon the market it revolutionized Reflex Camera construction, and was the first to start an era of improvement that has benefited the users of such instruments everywhere. The Adams MINEX, however, is a very great advance upon the VIDEX, and which it now supersedes.

New features are only introduced after actual prolonged trial, and are not put forward as improvements unless of real and practical value, and no device is adopted until it has been so thoroughly tried and tested that its utility has been amply demonstrated. Amidst the various changes that have been made, the original fundamental principles that gained, and have retained, for the Adams VIDEX its great reputation for accuracy, simplicity and reliability, have all been adhered to in the MINEX.

Although so simple, it is scientific in construction, and made throughout of the best materials, by the most skilled workmen, at our own London Factories. Every camera, before being sent out, has every part carefully tested to discover any error or weakness, in fact, everything is done to ensure the greatest possible perfection in manufacture.

Reliability, accuracy and simplicity of manipulation is a necessity, if photographic work is to be carried on with ease and success; and this is one great reason why the Adams MINEX is the best of all Reflex Cameras. No matter how perfect the mechanism of a camera is, if the workmanship is defective it will be a continual source of annoyance. The perfect and accurate construction of the Adams MINEX is, therefore, the foundation upon which its continual success may be relied upon. Accurate adjustments of parts is an absolute essential to any satisfactory Reflex Camera. Experience proves it keeps its adjustments better than any other Reflex Instrument.

Being the pioneers of the modern Reflex, we were the first to design the well-known triple focussing hood, and also the now well-known revolving back, which has been imitated by manufacturers in every country. These imitations, however, quite lack the smoothness and accuracy which has made our own of world-wide repute. The splendid rigidity of the MINEX is quite unequalled. The length of camera extension, its easy and accurate focussing, and the amount of rising front, are all points that cannot be obtained in any similar instrument.

FOR PORTRAITURE AND FIGURE STUDIES it is the most satisfactory, as not only is the best focus obtained for either sharp or soft results, but the most natural and pleasing expression or position is at once obtained, without inconvenience or boredom to the sitter, and the picture is focussed the right way up. It is the only Reflex suitable for slow exposure work, as well as high-speed work.

FOR NATURAL HISTORY SUBJECTS at close quarters, no other form of camera is of such service. The MINEX permits of the arrangement of the subject as well as the focussing of it right up to the moment of exposure, thus there is no doubtful judging of distances.

FOR LANDSCAPE AND GENERAL WORK it is also the best, as the subject can be so easily composed from different standpoints, as to ensure the best and most artistic position.

SPORTING AND ATHLETIC WORK is easier to accomplish with the MINEX system than with any other. The advantage of seeing what is being taken reduces the taking of photographs to the limits of simplicity.

PRESS WORK. No other Reflex is so thoroughly suitable for the Press worker. It is strong, reliable, simple, quickly manipulated, and light-tight. It readily accommodates a large variety of lenses, most of which can be arranged to be instantly interchangeable. Its equipment is far in advance of any other instrument for really all-round Press work As The British Journal of Photography says, it is "The machine par excellence for the Press photographer."

YACHTING, MOTORING, TRAVELLING, &c. The MINEX is the most complete instrument for all-round use. Always ready, and affording certainty of results.

SIZE. The MINEX is the smallest complete square form Reflex Camera, especially as it contains within itself three double dark slides. The only Reflex with a metal working in metal revolving back, and so arranged as to be removable to get at interior of camera.

	SI	IZES ABO	UT	Extension Plate to camera tront.	LENSES useable, measured fi back of lens mount to plate SHORTEST, *LONGEST			
	HIGH.	WIDE.	LONG.	about	about	about		
				in.	in.	in.		
44×34	7.	52	$6\frac{1}{2}$	$12\frac{1}{2}$	42	132		
5 ×4 or 9×12 c.m.	$7\frac{1}{2}$	$6\frac{1}{4}$	73	134	5 1 8	15		
$6\frac{1}{2} \times 4\frac{3}{4}$	$9\frac{1}{2}$	71	9	17	$6\frac{5}{8}$	181		

If measured to the outside of revolving back, the length is \(\frac{a}{2} \) in. more,

If lens panel and cone is reversed, from plate to front of cone, all sizes about 2 in. longer,

or more, according to focal length of lens fitted.

*Longer focus may also be used by having collapsible front extensions.

MIRROR SYSTEM. This is original with, and exclusive to, the Adams MINEX. It is the mirror reflecting system in its most perfect form. It reflects not only the picture obtained with a short focus lens, but also one of long focus. Its movement is practically imperceptible, and yet it rises automatically.

BELLOWS EXTENSION. A very long extension is provided, thus permitting of the use of a great variety of lenses, and a large magnification of object when a telephoto ens is used. At long extension no other Reflex possesses the rigidity of the MINEX.

FOCUSSING HOOD. Much care is taken in the fitting of this. It erects and folds itself, by means of opening and closing the lid, and fits comfortably around the forehead and eyes. Spectacle lenses are self-contained, thus avoiding a loose separate hood, also the hood is removable to enable the focussing screen to be cleaned or adjusted, and the interior of the camera cleaned. The hood will also take a top mirror for focussing at eye level or stand work.

EXTRA FOCUSSING SCREEN. An extra focussing screen for tripod work is carried inside camera. The MINEX is the only Reflex possessing this advantage.

CHANGING SYSTEMS. Nearly every changing device upon the market can be fitted, dark slides, changing boxes, daylight loading roll holders, Premo film pack adapters, also envelope plate and film changing apparatus.

FOCAL PLANE SHUTTER. The Adams MINEX Patent Self-Capping Focal Plane Shutter is the latest and most complete and perfect yet introduced. Every speed is engraved upon a dial, and it is merely necessary to place any of these speeds opposite the indicator, which is always correctly indicated whether shutter is set or not.

All speeds can be set either before or after setting the shutter, or in any other position, this being a great convenience.

Speeds are regulated mostly by width of slot only, which is instantly done from the outside. There is provided, however, two driving springs, this being a distinct advantage, both from the point of view of accuracy, and also keeping the shutter in order. All high speeds are produced by varying shutter slit, when driving high-tension spring, and all low speeds in the same manner, with low-tension spring. This is the perfect system at last.

Speeds are from $_{1000}$ th to $\frac{1}{8}$ th of a second by means of shutter slit, and from $\frac{1}{4}$ to 3 seconds by the additional pneumatic valve. "Time" and "Bulb" are also provided for.

It is incapable of being put out of order by fair means, and is most marvellously simple. It is self capping. This we believe to be finality in Focal Plane Shutter construction.

SWING FRONT. (A. L. ADAMS' PATENT.) The MINEX is the only Reflex having the advantage of a FOUR WAYS Swing Front. A correspondent published the following in The British Journal of Photography:—

"Let me point out its untold value in ordinary instantaneous work, or in press photography. Naturally you always try to get a little elevation if you can (on, let us say, such an occasion as some public event in the streets), both to secure better perspective and to get above the heads of the crowd; and, given such a slight elevation, the man whose Reflex is provided with a swing front can completely eclipse the efforts of his confrère whose camera is not so fitted.

"Perhaps the weather is bad and the chief subject moving rapidly; the use of a small aperture is impossible, yet with a large stop only a portion of the picture can be got into focus. Now just tilt the lens out at the top a bit—i.e., tilted looking downwards, and instantly even at the full aperture of the lens (if the focus be not too great), say a 7 inch at F4'5, the whole field of view, from the heads of the people immediately below you to furthest infinity, comes into sharp and clear focus, and the effect, as you see it on the ground glass in the top of the camera, corresponds exactly with that on the plate.

"I would suggest a front that would not only swing vertically but horizontally as well, and certainly no press photographer could afford to be without it once the instrument is obtainable,

"These swing movements are equally useful in getting foregrounds and prominent objects at one side of the plate into focus in landscape work, and once having learnt their full value, one can never be really happy with a camera which does not embody them."

Our new front swings the lens all four ways, and also registers the lens parallel to the plate when required. It is merely a small square panel, that is interchangeable with the small centre lens panel, and necessitates no alteration or addition to the camera itself. The extra weight is only about an ounce. To use a Swing Front, the lens must be of a little longer rocus, than the shortest it is possible for a camera to take. For cost see page 271.

LENSES. A large variety of lenses may be fitted, and frequently a number of different sizes and kinds may be made interchangeable in the same flange. The MINEX consequence of adapting, as also the Adams' Swing Front system, permit of reversal, thus a good additional extension of camera is obtained without increased weight or bulk. It is an advantage to purchase the lenses listed, as they are specially mounted in the most suitable and convenient style, and enable the stop values to be seen and manipulated from the front of the camera. As we are frequently asked to advise as to which is the best all-round lens, we may say we certainly recommend the Zeiss Patent Protar F6'3, especially as its single combination is so excellent, and it thus affords the advantage of two lenses of different foci. For those not willing or able to pay the cost of this lens, the Ross Homocentric will be found exceedingly good. F4'5 lenses are extremely useful for press photographers, also for portraiture, and high speed work, but they do not permit of the use of their single combinations. As a quick acting lens of this large aperture, we can strongly recommend the Zeiss Patent Tessar, and its price is very moderate. Lenses are not cut or interfered with, therefore are at once removable for use upon other cameras or enlarging lanterns. Customers' own lenses can nearly always be fitted in their original mounts.

TELEPHOTO LENSES. The MINEX is specially suitable for Telephoto work.

RISING FRONT. This is available for both horizontal and vertical pictures, to a greater extent than other Reflex Cameras, and the effect can of course be seen upon the focussing screen and finder.

CONSTRUCTION. The MINEX is the finest Reflex Instrument it is possible to construct. No pains have been spared to make it the most accurate, durable and complete camera that our long and unrivalled experience can provide. It is of finest workmanship, carefully adjusted and tested in every part; is as reliable for all climates as it is possible to make it, brass screws being used throughout, and extension runners are of metal running in metal to ensure easy and accurate focussing. The strong double rack and pinion is of diagonal pattern, thus ensuring greatest accuracy. A most concise illustrated Booklet of working instructions supplied. Being manufactured throughout at our own London Factories, a considerable saving is effected to importers, where there is a British tariff preference. Everything outside is very neat and unobtrusive.

Price List of Adams MINEX DE LUXE.

The cameras are priced complete with three best quality double dark slides, but without lens, owing to the variety offered for selection. For cost of Lenses see below. Automatic shutter speeds from 1th to 3 seconds are included. When the listed lenses are purchased from us, not only are they mounted and fitted in a special and convenient manner, but a reduction is made in the cost of the cameras (see below). They can only be obtained through Adams & Co. The amounts allowed for dark slides, if not required, are also quoted above.

SIZE.							R IF	Or	ASH der	not	slides required, educt	Extra Cos Patent 4-v Swing Fr	vays
41×31	-	-	£34	0	0		£29	0	0		21/-	25/-	
3½×2½	sq. mode	el, to	order.			sted lens as ‡ plate.		sed	deduc	t 20/-),			
5 ×40	r 9×12 C	.m.	£37	0	0		£32	0	0		27/-	25/-	
$5^{\frac{1}{2}} \times 3^{\frac{1}{2}}$	sq. mode	l, to	order.	Pri	(If li	isted lens £4 o o ext	purcha: ra on 4.	sed	deduc	t 20/-).			
6½×4¾	-	-	£47	0	O (It li	isted lens	£41 purchas	_	0 deduct	t 20/-).	45/=	30/-	СВ

IMPORTANT.-When above prices are remitted with order, we pay carriage and insurance to any part of the world.

Extra.—If camera is of polished teak, russia leather bellows and brass bound, 40/- net extra upon all sizes. We consider the ordinary model quite suitable for tropical climates, and do not think the above extra cost a necessity. Some may prefer it, however,

Dark Slides, Changing Boxes, Roll Holders, Film and Plate Adapters, also Cases and Tripods, see pages 279 and 280, +>64+

LENSES.

KUSS F. 6'8	HON	IOCEN	TRIC.	41	× 31	5×4 or 9×12,c.m.	$6\frac{1}{2} \times 4\frac{3}{4}$
5 in.	-		-		0 0		-244
6 in.	_		-	. 4 10	0 0	4 10 0	
7 in.	-		-			5 10 0	
8½ in.	-	-	-	. —			7 0 0
TEICO DAT							
ZEISS PAT	ENT	PROTA	AR, F.	6'3.			
No. 4a	. Speci	al $5\frac{1}{2} \times 9\frac{1}{2}$	-	- 8 1	5 0		
No. 7.	6½ in.	and 111	in.	- 9	4 0	9 4 0	
No. 10.	8 in.	and 14 i	n.				11 3 0
TEICO DAT							
ZEISS PAT	ENT	TESSA	R, F.	4.5.			
No. 15	6 in	l.	-	6 10	0	-	
No. 15	a. 710	in	-	-		8 0 0	
No. 16.	8½ i	n	-				10 0 0
TELEPHOT	ONE	GATIV	E				
ATTACH	MENT	rs.					

3 11 6 All lens prices are strictly net. British made Zeiss Lenses are supplied with all our cameras unless those of German make are specially ordered, when extra time should be allowed for obtaining same.

5 19 0

For above F. 6'3 Lenses, specially fitted F. 4'5

do. do.

Dallmeyer's ADON Telephoto Lens, do. -

SECOND-HAND DEPARTMENT

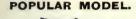
For the Sale and Exchange of High-class Apparatus.

All Cameras are thoroughly examined, and may be purchased with confidence. Well-known first-class instruments taken in Exchange for our own **New** specialities.

OHI OWN 144	specialities	D.							
No.							5	S.	d.
7. 3½×2½ Ada slides; cost	ms' VESTA, Ro	ss Homo. f	6.3 lens, s	ix slides,	and case	for		0	0
08. 63×31 Ster	eo. and Panoran and extra 6¾-in. H	Adams' II	DENTO, two	vo Stereo	. Ross Hon double slid	no.			
cost f.37	r Model 1909 Ada					20		0	0
changing be	x, Ross Homo. f/ms' IDENTO, Roplate Adams' cha	6.3 lens ; cos ss Homo. f/6	st £24 178.	6d.; cond adapter f	or Premo f	ilm	3 1	0	0
case; cost a	76 3s. 6d DEX, 5×4, and					10	I	0	0
200h f-6 60						W.	3 1	0	O
Zeiss roll ho	lder, extra reversi VIDEX, no slid	ing frame, le	eather case	cost £12		4	I	5	0
							3 1	5	0
65. Adams' 5× 67. Adams' Ha	VIDEX and six f-plate VIDEX, th	double dark ree double si	slides, no le lides, film pa	ens; cost ack adapte	£24 118. 6d er, Voigtlan	der	I		0
	ens, 9½ in. focus, a SS Complete Tele)	0	0
135 mm., f/3	; cost £ 15 15s. Guardia's }-pl. N	UDIA D	1	- 41		c. :	1		0
82. 5×4 Adams	YALE for twel	ve plates, C	ooke f/6.5	lens, and	leather ca	se;			0
86. 5×4 Adams	VIDEX, three d	ouble dark s	slides, 7 in.	Ross Ho	mocentric f/	6.3	I	5	
88. 5×4 Adam	ther case; cost £ IDENTO, Zeiss	patent Pro		in., f/6.3,	and film pa	ick			
90. 1-pl. GOER	best pigskin leatl Z ANSCHUTZ,	Goerz 7 in.	f/6 8 Dago		r double da	ark		0	
92. 1-pl. Adam	tht loading roll ho IDENTO, Ros	s Homocent	tric f/6.3 lei	ns, 3 doub		es,			
95. 5×4 Adams	REFLEX, 6 dt	ol. dark slide	es, Adams'	"Challen	ge" R.R. le	ns,		7	
oo. Postcard (5	ing hood, best was X32) Adams' IDI	ENTO, film	pack adapt	ter, Zeiss	patent Pro	tar	I	•	6
o3. 4-plate Ada	VIIa. No. 7, and c ms' VIDEX and	ase; cost £2 3 double da	21 2s. 6d. irk slides, l	Busch 6in	Omnar le		E	0	0
f/5.5, best le	ther case, also 3 of VIDEX, Adams vaterproof case, p	extra dbl. da	rk slides; c	ost £28 75	s. 6d	16		0	0
1/5.6 lens; c	ost £35 6s. 6d.					10	I	6	0
12. 5×4 Adams	VIDEX and 3 dl					12	I	7	6
14. Adams' VE	STA, $3\frac{1}{2} \times 2\frac{1}{2}$, with	Carl Zeiss	Tessar f/6.3	and six	slides in ca	se;	1		0
17. Adams' 1-p	. VIDEX and 6 dl	bl. slides, no	lens; cost	£23 28. 6	d	11	I		0
3 dbl. slides	IDENTO, Ross cost £13 18s.					8	I	7	6
f/6.8 lens, Re	Z-ANSCHUTZ lacka adapter and	24 envelopes.	leather cas	e. focussir	. Goerz Dag ig cloth, Go	erz			,
25. 4-pl. GOE	x, brilliant finder Z-ANSCHUTZ 1	atest model.	quite new.	Goerz Da	agor lens 5	in.	I	7	0
28. 4-pl. Adam	ides, Premo film a s' VIDEX, 3 dbl. 4.5 lens, leather o	slides, pater	it 4-way sw	ing front.	Voigtlande	rs	I	0	0
mirror; cos	£33 58. 6d 4, changing box					17	I	0	0
Sanderson;	cost £3 10s. 6d. or 8 plates; cost £					1	I,	0	6
	~	_							

ADAMS

VIDEX



The Adams VIDEX is probably the best known of all our popular Cameras. Introduced about 8 years ago, they are now to be found in use in every part of the world.

> >HE Popular Model of (the Adams VIDEX is a good and substantial Reflex Camera, of superior construction and design to other similar instruments upon the market, and should satisfy those unable to afford the cost of such a complete and perfect instrument as the Adams MINEX. not, of course, the exquisite finish of the latter, and is not so elaborately constructed, nor has it the refinement of details.

> The Focussing Hood, extra focussing screen in lid, revolving back, lens panel system, interchangeability of plate and film systems, are all similar to the Adams MINEX as described upon previous pages. The Focal Plane Shutter is different.

No Reflex Camera shutter has the advantages VIDEX FOCAL PLANE SHUTTER, No Reflex Camera shutter has the advantages - of the VIDEX form (excepting the Adams MINEX). Outside the camera is a circular metal disc with the following speeds engraved:—1000th, 10th, 3 seconds may also be given at an extra cost of 25/- upon all sizes. When shutter is set, indicator is visible opposite speed at which it is set for, and, most important feature of all, the speed can be altered while the shutter remains set, and without having to let it off, then alter, and then re-set. Is set with a QUICK WIND. Whilst most Reflex Instruments are designed for high speed work only, the VIDEX has been specially considered for both high and slow speed, thus making it a far more useful and all-round camera.

All lenses as listed with the MINEX are suitable for the VIDEX.

SWING FRONT. The same as described (see p. 270) and fitted to the MINEX may also be fitted to the VIDEX. The cost is 25/- extra.

CHANGING SYSTEMS. All as on page 280 may be fitted. Same as for MINEX. See p. 279.

CASES AND STANDS.

PRICE LIST. Complete, with three ordinary best quality double dark slides, but without lens, owing to the variety offered for selection (see p. 277). When listed lenses are purchased from us, not only are they mounted and fitted in a special and convenient manner, but a reduction is made in the cost of the cameras (see below). The amounts allowed for dark slides, if not required, are also quoted below.

Slow Shutter If slides Swing Or if Cash Front, Speeds. not required, with order deduct extra. extra. 41×31 £16 16 0 21/-25/-25/-£19 10 0 (If listed lens purchased deduct 20/-) £18 18 0 5×4 or 9×12 c.m. £22 0 27/-25/-(If listed lens purchased deduct 20/-)

IMPORTANT.-When above prices are remitted with order, we pay carriage and insurance to any part of the world.



ABSOLUTELY THE SMALLEST AND LIGHTEST CAMERA IN THE WORLD.

E introduce the Adams VESTA for those requiring a complete instrument of absolutely the smallest dimensions possible. Lazy tong systems have previously only permitted of a rising front one way of the plate. The VESTA permits of a horizontal and vertical rise, thus rendering it a fully practical instrument. It is the only small camera of its size capable of taking large aperture F 4'5 lenses.

LONG. WIDE. **SIZE AND WEIGHT** SIZE. THICK. WEIGHT. 18 ozs. $\int 3^{\frac{1}{2}} \times 2^{\frac{1}{2}} (6^{\frac{1}{2}} \times 9 \text{ c.m.}) -$ 43 with Dark Slide 144×34 and F 4'5 lens.

If with F 6'3 lenses, $3\frac{1}{2} \times 2\frac{1}{2}$ is about 2 ozs., and the $4\frac{1}{4} \times 3\frac{1}{4}$ 7 ozs. lighter.

LENSES. Kept in stock with Zeiss Patent Tessar F 6'3 and F 4'5. Other lenses to order. The $3\frac{1}{2} \times 2\frac{1}{2}$ is fitted with F 6'3 lenses of $4\frac{3}{8}$ in focus and F 4'5 of $4\frac{1}{2}$ in focus; the $4\frac{1}{2} \times 3\frac{1}{2}$ size with F 6'3 of $5\frac{1}{2}$ in focus and F 4'5 of 6 in focus. **SHUTTER.** Pneumatically controlled for speeds from $\frac{1}{2}$ to f a second to 1 second,

also time and bulb exposures. Patent Antinous Release fitting can also be supplied, at 2/6 extra. The shutters fitted with F63 lenses have marked speeds from 210th of a second. The $3\frac{1}{2} \times 2\frac{1}{2}$ with F 4'5 from $\frac{1}{2} \frac{1}{60}$ th, and the $4\frac{1}{4} \times 3\frac{1}{4}$ with 4'5 from $\frac{1}{12} \frac{1}{0}$ th of a second. All sizes

work down to r second, also TIME and BULB.

PLATES AND FILMS. Single metal dark slides are provided for plates, and a

PLATES AND FILMS. Single metal dark slides are provided for plates, and adapter are special adapter for the use of daylight loading Premo film packs. Slides and adapter are

interchangeable in the same camera without any additions.

FINDER. A large visual finder, showing the action of the rising front. It automatically places itself into position when the camera is opened, and also automatically closes and folds itself in when the camera is closed, and is the only finder offering these unique advantages.

Finder also has a vertical folding mirror so camera may be held at waist level, if preferred.

RISING FRONTS. The VESTA is the only camera of its size having a horizontal and vertical rising front, and this to the extent of a quarter of the plate each way.

OPENING AND CLOSING. Upon opening the flap or baseboard, the front slides out into its fixed position. Touch its catch, and it slides back again. The action is instantaneous. FOCUSSING. Focusses to various distances by rack and pinion, and pulls out instantly "infinity. to Besides engraved scale, hooded ground glass focussing screen is supplied.

TRIPOD BUSHES. Two are fitted to the camera, permitting it to be used upon a tripod both horizontally and vertically. This advantage is not usually provided for upon such an instrument. For using with Zephyr tripods, see p. 279, a special Vesta tripod top is recommended for obtaining rigidity. 32×24, 5/6, and 4½×34, 6/6 each.

GENERAL CONSTRUCTION. Made mostly of strong aluminium alloy, together

with brass and German silver, and has leather covering and leather bellows. Is exceedingly strong and well constructed, and unusually well finished in black, and unobtrusive in use. All fittings are self-contained inside the camera, protected from dust.

ADAMS CAMERAS are equipped with every convenience and refinement that experience can suggest, and are unparalleled in any city of the world.

The ADAMS VESTA

(Designed and Patented by A. L. ADAMS.)

HE smallest, most compact, and complete pocket Camera obtainable. Has an ample rising front **both** ways of the plate. This applies to both $3\frac{1}{2} \times 2\frac{1}{2}$ and $4\frac{1}{4} \times 3\frac{1}{4}$.

ZEISS PATENT TESSAR F 4.5 AND F 6.3 LENSES.

All the excellences which, united, constitute perfection, all those rare qualities that practical workers require, and those advantages that simplicity and reliability confer—these, and more, does the **Adams VESTA** offer you!

Carry one in your pocket EVERY DAY and ALL THE DAY. You'll never find it in the way.

It is far and away the best Camera of its kind for Colonial and Tropical use, also travellers requiring a really strong compact instrument that may be relied upon under all circumstances.

PRICESinclude Camera, six slides and focussing screen, and Zeiss Patent Tessar F 6·3 Lens, and a leather case for the slides. If slides are not required 15/- may be deducted for the $3\frac{1}{2} \times 2\frac{1}{2}$, and 17/6 for the $\frac{1}{4}$ pl.

			Price						To	If ZEI essar l f F 6'3	F 4°5	inst	ead
$3\frac{1}{2} \times 2\frac{1}{2}$ (6\frac{1}{2})	×9 cm.) £1						11	0	-	£I	15	0	
4½×3½ -	1	5	15	0	-	13	13	0	-	2	2	0	CB

IMPORTANT.—When above prices are remitted with order, we pay postage and insurance free of cost to any part of the world.

EXTRAS.		al × a	1	1	1 × 21	
Antinous Release	Lo	2	6	£04	2	6
Extra 6 Slides, in case	0	17	6	0	19	0
Special Metal Film Pack Adapter	I	5	0	I	12	6
Pocket Case for Camera, screen, adapter or slide	0	7	6	0	9	6
Tripod Top for Camera		5	6	0	6	6
Best leather Case with shoulder strap, to hold						
Camera Screen and slides, side by side	0	17	6	1	0	0
		•			C	B

ADAMS & Co., 24 Charing Cross Road, LONDON, W.C.

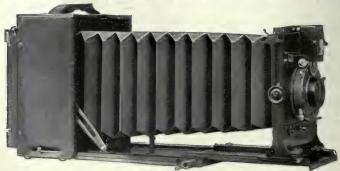
Telephone 4931 Gerrard.
Telegraphic Address: "PYRO, LONDON."

Adams

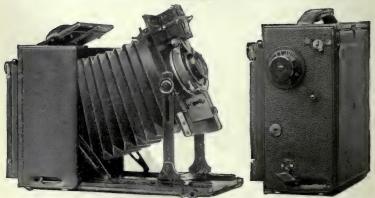
VAIDO.

(MODEL DE LUXE.)

AN INSTRUMENT OF SUPERB CONSTRUCTION, GREAT PRECISION AND THOROUGH RELIABILITY.



MODEL A.



MODEL A.

MODEL B.

THE ADAMS VAIDO is a great advance upon Cameras of similar style. Model B is fitted with our new Patent MINEX self-capping Focal Plane Shutter, as p. 269. With this model no other shutter is necessary. Wide angle, long focus or telephoto lenses may be fitted by merely screwing upon panel. This type of instrument has previously been rendered unreliable as a hand camera, owing to the inaccurate and unsuitable position of the view finder, which does not attempt to show action of rising front. The VAIDO is fitted with the Adams patent IDENTOSCOPE.



THE ADAMS VAIDO is made in Models A d B. The only difference is that Model B is fitted with our MINEX Self Capping Focal Plane Shutter, as p. 269, and no other is required, but a front diaphragmatic shutter may be added if pre-ferred. Model "A" is for front shutters of all leading kinds.

SWING FRONT. This is shown in second illustration upon page 276.

A double rising front is RISING FRONT. A double rising front is provided, the first being rack and pinion from the right hand side, and gives a rise of about a quarter of the vertical plate, and still more upon the hori-The Adams Patent IDENTOSCOPE shows the whole of this rise. There is a still greater rise of some inches also provided, thus providing more than upon other cameras.

p. 280. Takes all kinds as

Adams REVOLVING Back to all models.

LENSES. All kinds of lenses may be fitted series. Those listed are strongly recommended. All kinds of lenses may be fitted, up to the normal large apertured F. 4'5

FOCUSSING. Best quality hooded focussing screen supplied. Accurately engraved scales. Focusses out immediately to locking stop. Rack focussing both for wide angle and ordinary lenses.

The best Camera of its type it is possible to make. Being finished GENERAL. The best Camera of its type it is possible to make. Being black it is most inconspicuous. Manufactured complete at our London Factories.

PRICES include Camera complete, and three double dark slides as page 280. If slides not required deduct as for MINEX, page 271.

		oximate cludir		from				Or	if Ca	ısh	with	NEX	
Size.	Rev	olving	Back	Screen to Lens	Liet	Price		v	vith			al Pl	
	High.	Wide.	*Thick.	Board.	13131	1 1100		C	rder			e p.	
½ pl.	63 in.	5½ in.	3½ in.	13 in.	£15	0	0	12	12	0	4	-	0
5 or 9.12 cm.	7	$6\frac{1}{8}$,,		161,,		5		13	13	0	5	o	0
$6\frac{1}{2} \times 4\frac{3}{4}$	91 ,,	0		21 ,,	22			18	18	0	5	15	0
× 700 4							1 .					-	

* If fitted with MINEX Shutter about ½ in. thicker and ½ in. longer extension. CB IMPORTANT.-When above prices are remitted with order, we pay carriage and insurance to any part of the world.

mourance	to any part o		
ROSS F. 6:8, HOMOCENTRIC.	41 by 31	Compound 5 by 4 Shutter. or 9 by 12 c.m.	61 by 41
5 in	4 0 0	35/-	
6 in	4 10 0	40/- 4 10 0	
om.	4 10 0	Compound Shutter	
		2 0 0	
. • .			
7 in		- 5 10 0	
		Compound Shutter	
		2 2 0	
8½ in			7 0 0
		Cor	npound Shutter
TEISS DATENT DOOTAD E CO			2 14 0
ZEISS PATENT PROTAR, F. 6:3	8 15 0	40/-	
, 7. 6½ in. and 11½ in.	9 4 0	40/- 9 4 0	
,, 7. 07 m. and 112 m.	8 4 0	Compound Shutter	
		2 0 0	
0: 1 :		2 0 0	44 0 0
,, 10. 8 in. and 14 in			11 3 0
		Cor	apound Shutter
ZEISS PATENT TESSAR, F. 4.1	5.		2 8 0
No. 15. 6 in	6 10 0	48/-	
,, 15a. 710 in		800	
77 234 710 111		Compound Shutter	
		2 14 0	
-C 01 !		2 14 0	10 0 0
,, 16. 8½ in			
		Con	pound Shutter
			3 0 0
TELEPHOTO NEGATIVE ATTA	CHMENTS	see page 271.	CB

TELEPHOTO NEGATIVE ATTACHMENTS, see page 271.

ADAMS



Unsurpassable and Incomparable.



1.—The Adams "IDENTO" is made $4\frac{1}{4} \times 3\frac{1}{4}$, 5×4 , $5\frac{1}{2} \times 3\frac{1}{4}$ (Post Card), and $6\frac{1}{2} \times 4\frac{3}{4}$. (The $5\frac{1}{2} \times 3\frac{1}{2}$ Slides and Changing Boxes are for $5\frac{1}{2} \times 3\frac{1}{2}$, but Premo Films are $5\frac{1}{2} \times 3\frac{1}{4}$.)

2.—Shutter in lens diaphragm slot opens and closes to centre, and speeds are as accurately regulated as possible, by air in metal tube, from 1871th to 1/2 a second, also TIME exposures, Patent Antinous release, 2/6 extra. The Adams Self-capping Focal Plane Shutter, as page 281, can also be fitted.
3.—Lens, Shutter, IDENTOSCOPE Finder, &c., are self contained. When closed every-

thing is protected from dust or damage.

4.—The Adams Patent IDENTOSCOPE, which always shows the true view, even when the Rising Fronts are used! The most valuable fitment ever applied to a hand Camera. Visual Finders with magnifying lenses, for holding up to line of sight, may be added, 5/6 upon first 3 sizes and 7/6 on 1 pl.

5.—Its compactness and portability are surprising. Instantly opened, instantly closed.
6.—Thoroughly strong and rigid, nothing flimsy. Mostly constructed of metal. Spirit

level for vertical and horizontal pictures.

.-Best lenses fitted, namely, Ross Homocentric F 6'8 and Zeiss Patent Protar F 6'3, and small folding extra extensions can be supplied for using front single combinations. Lenses removable for cleaning, or for using upon other Cameras or Enlarging Lanterns.

8.—Any kind of changing system can be used—Flat Film or Plate Changing Boxes, Daylight Loading Roll Holder, Dark Slides, or Daylight Loading Premo Film Pack Adapter. All are interchangeable in the same Camera.

9.—A good rising front is provided horizontally and vertically, and the result of each movement is shown in the IDENTOSCOPE.

10.—Bushes provided for fitting to tripod, for horizontal and vertical pictures. Strong

neat handle for carrying. Plate or film can be carried ready to give an exposure.

11.—Ground glass focussing screen. Accurately engraved focussing scale also provided, and Camera is ready focussed for "infinity" without trouble of adjusting same.

12.- Everything is of the finest and most accurate description. An examination of it at once conveys the impression of freshness and novelty-of Camera Perfection Crystallised.

Complete with Ross Homocentric F 6'8 Lens, Adams carefully regulated "IDENTO" Shutter, Patent IDENTOSCOPE; Film Pack Adapter for Premo Films handsomely covered in best morocco, with special pocket (deduct cost of this Adapter if not required, see p. 280 for any other changing systems preferred). Camera covered in best morocco, thus being most unobtrusive.

Size.	Thick.	Wide.	Long.	Weight, about.	Cash Price.		ar F		Single		
$4\frac{1}{4} \times 3\frac{1}{4}$		41 in.			£12 15 6			0 .	£o	18	6
5 × 4	1 7 in.	47 in.	6½ in.	27 OZ.	14 18 6	5	0	0	I	0	0
$5\frac{1}{2} \times 3\frac{1}{2}$	17 in.	48 in.	6§ in.	26 oz.	15 15 0	5	0	0	I	2	6
$6\frac{1}{2} \times 4\frac{3}{4}$	28 in.	53 in.	73 in.	46 oz.	18 18 0	5	15	0	I	5	
											CB

Adams & Co.'s Cases.

FINEST QUALITY. See our name is upon them.

Cases listed for Camera and 6 Slides also take Changing Box or Roll Holder *instead* of the 3 extra slides.

No. 1. Best quality, thoroughly waterproof, thick collapsible canvas, chocolate colour, and adjustable web sling strap.

(IDENTO, are lighter quality and velvet lined.)

No. 3. Best quality, solid hide, black or buff, lined velvet, lock and key, and detachable adjustable best web strap. MINEX Cases have also good rounded handle.



Extended Cases have buckle straps, as shown, as well as lock. Detachable web strap is shown in front of case.

very e	quality, s	ize, and	style of Ca	se supp	lied	. (CB	Style No. 1.	Style No.
MINE	K }−pl. tak	ing Came	ra and 3 slid	les -	-	-		17/6	33/6
**	₫-pl.	do.	do.	-		-	-	17/6 18/6	35/-
**	⅓-pl.	do.	do.	-	-	-	-	21/-	33/6 35/- 50/-
**	d-pl. tal	king Came	ra, 6 slides		-	-	-	20/-	37/-
**	₫-pl.	do.	do.		-	-	-	21/-	39/- 55/- 17/6 18/6
3.9	½-pl.	do.	do.		-	-	-	24/-	55/-
IDENT	ro ‡-pl. f	or Camera	, Screen and	d Film A	dapte	r	-	6/6	17/6
**	and and	$5\frac{1}{2} \times 3\frac{1}{2}$ -pl.	do.	do.	-		-	7/6	18/6
* *	⅓-pl.		do.	do.			-	9/6	21/-
	-pl.	do.	including	8 pl. Cha	nging	g Box	-	7/6 8/6	19/6
* *	and	$5\frac{1}{2} \times 3\frac{1}{2}$ -pl.	do.	do.			-	8/6	20/-
11	⅓-pl.		do.	do.			-	10/6	23/-



Adams & Co.'s "MINEX" TRIPOD. Best 3-fold, rule joints, special brass bound, and 3 cross lay mahogany top, and fitted with two tripod bushes. Not illustrated. Very rigid and firm.

No. 1 for quarter or

¶ MINEX, or

¬Pl. Stand Cameras -

1 8 6

No. 2 for

¬Pl. MINEX or

¬Pl. Stand Cameras -

1 8 6

No. 3 for 12×10 or 15×12 Cameras -

2 2 0

Revolving Turntable Top, instead of Fixed Top, 7/6 extra. and quality, for 1 and 1 Hand Cameras, open 54 in.;

closed, 22½ in. - - - - Price 0 12 6

MINEX LEATHER TRIPOD CASES, with handle, 10/6.

Adams & Co.'s "ZEPHYR" TRIPOD. Tubular metal, rigid, portable, light. Quickly erected without adjustment. Closed as quickly. Adjustable height. Regulation & Whitworth screw supplied. Nos. 3, 7 and 8 are suitable for the Adams "IDENTO."

						closed.	Open. Inches.	Net Price.
No.	I Brass tu	bular, cire	cular legs	-	. ^	16	40	4/6
1.1	2 Do.	do.	do.	-	-	151	47	9/6
1.2	3 Strong n				-	12	49	12/6
9.9	4 Aluminiu	ım do., ci	rcular legs		-	142	50	15/6
2.2	7* Do.	do.	do.	-	**	111	48	27/6
**	8* Do.	do.	do.	-	-	132	60	30/-

*7 and 8 are our Specialities and best quality. Aluminium protected in working parts by brass guides, giving extra strength and rigidity. They close shorter than others.

ZEPHYR LEATHER CASES, with handle, 3/6.



Adams Changing Boxes.

Best manufacture, covered in black real morocco leather, and take 12 plates. Fitted with roller blind shutter moved from back. Plates can be covered or uncovered at will without having to change a plate. No light traps to get out of order, and no draw-out shutter to be troubled with. Numbers on sheaths are seen from outside back of box. Bags are of special quality leather, pliable and free from slightest dust, and will stand wear for many years. Plates lifted from front and placed after exposure at back. All prices complete with sheaths. Extra for aluminium light-weight sheaths, ½-plate 2/6; ½-plate 3/-; ½-plate 7/6.

12 plates— $4\frac{1}{4} \times 3\frac{1}{4}$, **60/-**; 5×4 , **70/6**; $6\frac{1}{2} \times 4\frac{3}{4}$, **85/-**. 8 plates— $4\frac{1}{4} \times 3\frac{1}{4}$, **45/-**; $5\frac{1}{2} \times 3\frac{1}{2}$, **50/-**; 5×4 , **55/-**; $6\frac{1}{2} \times 4\frac{3}{4}$, **70/-**.

"A" pattern, a cheaper quality for 12 plates. 1-plate 30/-; 1-plate 32/6; net. CB

Double Dark Slides.

		Teak.		
41×31		 ck polished. 9/-	10/6	
5 ×4		 11/-	12/6	
or 9×12		 13/-	15/6	
52 ^ 52 61 × 43		 18/6	21/-	

Daylight Loading Systems.

All our Cameras (excepting VESTA, which only takes metal slides and Film Pack Adapter) will take daylight loading roll holders, or Premo film packs. The Film Pack Adapter is handsomely covered in morocco, and has a convenient pocket at the back for holding the draw-out shutter when out of use. This form can only be obtained direct from us.



CB

Roll Holders— $\frac{1}{4}$ -plate, £1 15s.; $\frac{4}{4}$ -plate, £1 17s. 6d.; $\frac{1}{4}$ -plate, £2 10s. Adapters for Premo Film Packs— $\frac{1}{4}$ -plate, 15s. 6d.; $\frac{1}{4}$ -plate, 18s. 6d.; $\frac{1}{5}$ $\frac{1}{4}$ ×3 $\frac{1}{4}$, £1 1s.; $\frac{1}{4}$ -plate, £1 5s.

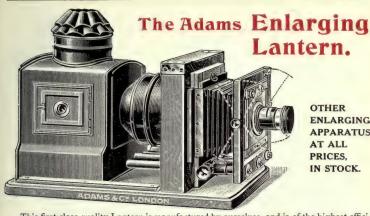
VESTA pattern do.— $3\frac{1}{2} \times 2\frac{1}{2}$, £1 58.; $4\frac{1}{4} \times 3\frac{1}{4}$, £1 128. 6d.

VIDEX PLATES.

For all classes of Work. Possess advantages in the way of latitude of exposure and density, and will stand climatic and keeping tests better than others.

Clouds may be obtained upon the same negative. Halation reduced to a minimum, and is further reduced by having them backed.

	1	SOCHROMAT		ECIA	L RA	PID.		TREME F					
		(Watkins	130. Wyn:	ne F78	3.)	(1	Vatkin	s 250, Wy	ynne l	F90.)		Back	king Extra.
31×21	-	per doz.	1/-	-	-	-	-	1/4	-	-	-	-	3d.
41×31			1/6	90.00		-	-	1/10	and .	-	-	-	3d.
5 ×4	-		2/4	-	-	-	-	2/10	-	-	-	-	4d.
54×34	-	11	2/4	-	-	-	-	2/10	-		10	-	4d.
61×43			3/4	-		-	-	4/2	-	-	-	-	6d.
$8\frac{1}{2} \times 6\frac{1}{2}$	-	,,	6/3	-	-	-	- 1	7/9	-	-	-	-	9d. CB



OTHER ENLARGING APPARATUS. AT ALL PRICES. IN STOCK.

This first-class quality Lantern is manufactured by ourselves, and is of the highest efficiency. The wood parts are of first quality mahogany, strongly clamped and brass bound at corners. Body is of Russian iron and copper. Also provided with spherical reflector. Condenser is best white glass and high power.

Swing front as shown. A most useful movement, enabling operator to correct any error in perpendicular lines on negative. Quick draw motion provided for extending front, also rack and pinion motion, which may also be used for fine focussing.

Fo

Rising and cross front, long extension bellows, and reversing negative holder, so enlargements can be made either way at will. By means of special carrier, negative may be adjusted to any position.

Good quality projecting lenses, with rack and pinion. Orange glass cap for exposing. Brices strictly net

r Negatives up to	Condenser.	Without Lens.	With Lens.
41×31	5½ in.	£6 17 6	£8 5 0
5 ×4	61 in.	£8 8 0	£10 0 0
5 × 4 6½×4¾	81 in.	£10 10 0	£12 17 6
*81×61	rr in.	£21 10 0	£25 0 0 CB
	G 1 5		

If best Lens is required, the Zeiss Patent Tessar F 4'5 is recommended. For prices see p. 271. Prices include powerful duplex oil lamp or fittings for incandescent gas

burner, or fitted for electric light, or incandescent spirit lamp. Oxyhydrogen blow-through jet, 10/- extra; acetylene generator and jet complete, 20/- extra on all sizes. Oil lamp sent unless other-

*This is an unusually handsome and well built Lantern.

"ADAMS" Self-Capping Focal Plane Shutter.

Can be altered to any speed, after settling. In stock for Sanderson and "IDENTO" Cameras, for

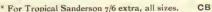
others reversing back and dark slide should be sent. Speeds from 1000th to 150th of a second, and aperture

can be fully opened for focussing.

Is primarily intended for Cameras having a front lens shutter, thus range of speed is ample for all purposes.

About one inch thick. Is simple and reliable in its mechanism, and blind material is of strong tropical quality. Speeds obtained solely by width of shutter aperture. Price complete, for*Regular Sanderson or "IDENTO"

Cameras (for others a small extra charge for fitting may be necessary):- $4\frac{1}{4} \times 3\frac{1}{4}$, 60/-: 5×4 , 65/-: $5\frac{1}{4} \times 3\frac{1}{4}$, 70/- $6\frac{1}{4} \times 4\frac{3}{4}$, 75/- net.



"A.B." shows 2 views, horizontal and vertical. "B.B." one view, either horizontal or vertical.

Size						Size of View seen.	Pat A.B.	tern. B.B.			
No.					 	4× 48	10/6	7/6 e	ach)	43	
MO.	I					16 × 3	12/0	10/		20	
0.0	2				 	18 ^ 4	13/0	12/-	19	œ_:	
	2	In	Alumin	ium	 		15/6	14/-	12	- 5 c	
	_					14×14/16	17/6	15/-	,,	0	
0.9	3		Alumir				20/-		"	2	C
	2	l m	Alumir	1111773	 		20/-	17/6	** J		



THE ONLY ACCURATE FINDER.

No other Finder can possibly show the amount given by a 5 in. on a 2 plate, 6 in. on a 4. and so on. They only show about two-thirds of the proper view, and are most misleading. The ADAMS is fitted to all best quality Sanderson Cameras.

THE



'Adams' aza' Finder

The best low-priced Finder obtainable.

A modification of the famous "ADAMS," Revolving Wheel gives horizontal or vertical view. 5/- each. Postage 1d.

ADAMS & CO.'S

Will stand rough usage. For travellers. window on runners, so that white light may be obtained if desired. For plates up to 8½ by 6½. Size, 24 by 17 by 5. Price £3 38. 0d. net.

Strong Tripod for same £1 78. 6d. net.

ADAMS & CO.'S 'Challenge'





The only practical Level. When ordinary Level is placed on top of Camera, it cannot be seen, being too high.

The 'Challenge' Level is seen right through, and may be placed

against side of Camera also, or against focussing screen to see it is truly perpendicular.
Small enough for vest pocket, and is most useful for all Cameras

when used upon a stand. Price 2/6 each, Postage 1d. CC**

ams & Co.'s View Meter.

Same Meter answers for a large variety of Lenses

plate.

Same meter any measure states of a same five same angle as Lens in use. Gives same angle as Lens in use the plate from the position of the operator may be at once seen without the trouble of erecting Camera. Also enables operator to tell at a glance the best angle lens to use in order to obtain most arristic rendering of his subject, and spot where necessary to place Camera in order to embrace particular subject on

Made in Aluminium, Price 12/6. Postage 2d.



Adams & Co., 24 Charing Cross Road, LONDON, W.C.

HUGHES' BIJOU ENLARGERS AND COLOR PHOTOGRAPHY LANTERN

GIVE ABSOLUTELY THE FINEST RESULTS.



THE WORLD'S BEST.

Is Half Your Time Worth Saving P

Is the quickest ENLARGER made, Scientifically Constructed, with Bellows each side of the Condenser, giving the reciprocal necessary for any focus front lens, with open front for Scientific demonstration, or tank, as an ordinary lantern.

Built on the Equipoise Principle for Perfect Centring and Balance.

HUGHES' BIJOU ENLARGER, COMPLETE WITH ILLUMINANT, RECTANGULAR CONDENSERS AND LENS.

Either Pamphengos Oil Lamp, Acetylene Jet, or Incandescent Gas Burner:-

Whole-plate, equal to 12 in. Circular Condenser		 18 10 0
Half-plate $\frac{81}{2}$, $\frac{81}{2}$, $\frac{81}{2}$		 12 10 0
0 11	• •	 7 7 0 6 10 0



the use of own Camera or Bellows Attach-

Whole-plate Five by four £4 0 Half-plate Quarter-plate

W. C. HUGHES & Co., Specialists in Optical Projection, BREWSTER HOUSE, 82, MORTIMER ROAD, KINGSLAND, LONDON, N. 19

Patent Rectangular Condensers for Enlarging.

(HAVE NO THIN EDGES.)

Best English Lens. Annealed to stand heat, as used by "Yan der Weyde, Esq." "This Condenser is periect" for Enlarging—it passes the light in equal distribution; all rays emerge with same velocity, gives a perfectly flat picture from edge to edge—impossible with the ordinary circular condenser.

1-plate (48 × 35)	 £1	15	0	
$5 \times 4 \ (5\frac{1}{2} \times 4\frac{1}{2}) \dots$	 2	12	0	
Post Card (5\frac{1}{2} \times 3\frac{7}{2})	 2	7	6	
$\frac{1}{2}$ -plate $(7\frac{1}{2} \times 5\frac{1}{2})$	 3	3	0	
1 mloto (01 v 71)		22	-	



Hughes' Patent ALPHENGO Reflecting, Enlarging Lantern.



ENLARGING DAY OR NIGHT.

The very thing wanted. An innovation.

No Condensers. Enlarges Copies. Does everything. Reduces & makes Magic Lantern Slides. Results unequalled. Marginal & even illumination, ready day or night. Enlarges any size. To be used with own Camera.

Enlargements softer, more even and delicate in tone. The whole thing scientifically constructed; just the very thing for amateur and professional photographers.

PRICE— $\frac{1}{2}$ plate to $3\frac{1}{4} \times 3\frac{1}{4}$, 20s.; $\frac{1}{2}$ -plate to $3\frac{1}{4} \times 3\frac{1}{4}$, 20s.; $\frac{1}{4}$ -plate to $3\frac{1}{4} \times 3\frac{1}{4}$, 20s. 20s including nest of carriers for all intermediate sized negatives and two Incandescent Burners.

British Journal of Photography,—"We are very much surprised that an arrangement of this kind is not universally in use amongst professional photographers for copying prints by artificial light in the dark days of winter."

Amateur Photographer.—"The condenser is dispensed with. Uniformity and desirable softness of light. An ordinary camera is employed. Exceedingly simple in use."

The Practical Photographer.—" Gives a fine even illumination. In short, the amateur's friend. It only needs to be known to be appreciated."

PATENT Portable Enlarging Stand.

'Every Photographer should have one of these stands. There is nothing like a **Ground Glass Screen** for delicate focussing. Useful for any Enlarger, Cinematograph pictures, opaque objects, and lantern slides. Draws out to 5½ ft. Closes 30 inches. Height 30 inches. Size of Ground Glass Screen, 20×18. Larger sizes made to order.

Price, substantially made, nicely finished, 32/-. Ground Glass Screen separate, 10/6.

Illustrated Lists of all stated above, 3d. free.

W. C. HUGHES & CO., Specialists in Optical Projection, BREWSTER HOUSE, 82, MORTIMER ROAD, KINGSLAND, LONDON, N. Being legitimate manufacturers, we give the best and most technical at the cheapest possible rate.

INJECTOR "BREWSTER"



THE JET OF THE FUTURE.

A New Jet burning House Gas from the Main and Oxygen.

This Jet draws the gas from the ordinary supply, and forces it through at great pressure. As powerful as mixed Jet, at half the cost. More powerful, consumes less than any similar type of Jet.

> Price 30s.

CANDLE-POWER 1.000. Oxygen Consumption 4ft, per hour.

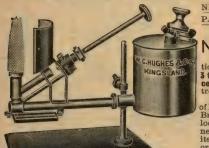


"KING OF JETS." With Improved Light cut-off. Double Plunger no fear of gases popping. Approximately 2,000 Candles. INCOMPARABLE. After exhaustive experiments we claim the most reliable and per-

fect Jet yet made. On the Dr. Hemmings' safety principle. Burns with great ease. Powerful and brilliant light. The Gases cannot burn back, having special safety chambers, therefore less liable to reflex action. A pure white light suitable either for an Ether Saturator or two gases.

MAGNIFICENT JET. HIGHLY FINISHED.

Scientifically constructed, giving finest results. Solid as a rock. Price, including tray and substantial lime turner. £3 10 0. Without light cut off, 50/-



PATTERN

INCANDESCENT MANTLE LAMP.

The Illuminant of the Future.

NO SMELL 200 CANDLE POWER

No Rubber, or any flimsy connec-Burning methylated spirit 3 times the power of any incandescent gas-burner, and is no more trouble than an ordinary gas jet.

It surpasses all other Mantle forms of Illuminant, and is made entirely of Brass, without any parts to become loose or deteriorate, and as it makes neither smoke nor smell, it lends itself to lantern work in place of Oil or Acetylene. It is perfectly safe, and has no glasses to break. Price .. 35/-

W. C. HUGHES & CO... 82, MORTIMER ROAD, KINGSLAND, LONDON, N.

CINEMATOGRAPHS

We have raised their construction to an art, have 12 Models to select from, and hold as many patents. There are no finer Projectors than ours, or cheaper.

The Cheapest, £3 5 0.

The Best, 50 guineas.

Rotograph Attachment, 10-inch Spools, all Bioscope Movements, £6 10 0.

THE BREWSTERGRAPH, No. 3.

A Great Combination in One Machine, Complete £20.

Mechanism only, £10 10 0 and £13 13 0, as illustrated.

The most magnificent value ever offered in a Showman's Machine.



"The Art of Projection.' Complete Manual on Lantern and Limelight Manipulation. Post free, 1/4.

Save money by going direct to the Manufacturers:-

W. C. HUGHES & Co., Road, Kingsland, LONDON, N.

HOUGHTONS L I M I T E D



The Largest Manufacturers of Cameras and Photographic Apparatus in the Kingdom

88/89 HIGH HOLBORN LONDON W.C.

TELEGRAMS: "BROMIDE LONDON."

TELEPHONES: 2500 HOLBORN (5 lines)

GLASGOW BRANCH:

70/78 YORK STREET, GLASGOW

OPTICAL BRANCH :

95 HATTON GARDEN, E.C.

FACTORIES (BUILDINGS COVER 22 ACRES)

ENSIGN WORKS, WALTHAMSTOW

The "Sanderson" Hand Cameras.

The "Sanderson" still holds an unrivalled position as the most useful and valuable camera for all-round work. Combining as it does the manifest advantages of a field camera with the portability and "instantly ready" character of a hand camera, it is the ideal instrument for a skilled



It's simplicity
The univer worker. unequalled. universal swing front, the movement that has made the "Sanderson" famous, provides for the rising and swinging of the Lens Front in any direction, and yet allows the action to be entirely governed by a single pair of locking All the actions of nuts. " Sanderson " the controlled from the back. The Lens swings on its axis and travels upwards, forwards backwards on a pair of struts slotted in The action full length. is always steady, smooth and regular, and there is no danger of the lens "dropping" and necessitating retocussing. The "Sanderson" movement is quite unique and is covered by a large number of patents. must be understood however, that in the "Sanderson," all these movements are held in

reserve and need only be brought into action when wanted.

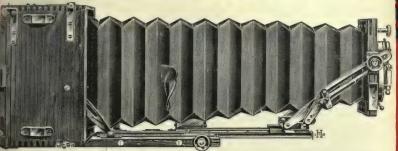
For ordinary snapshot work the front is merely drawn out to the infinity point, where it locks at the correct focus and the camera is instantly ready for snapshot use,

Let us send you a 68-page booklet which describes the various hand cameras in the "Sanderson" series. This book is beautifully printed, is full of pictures and describes the cameras in detail.

	a, as ture of pactures and describe		-	****					
No.	DESCRIPTION.	1 44 >	× 31	in.	_5×.	4 in.	61	× 44 i	in.
1	Camera, complete with "Beck" Convertible Double Aplanat Lens, f/7, 7, 3-Foci, "Automat" Shutter, Brilliant Finder, Level, and 3 Double Plate Holders.		s. 10			s. d.		s.	
1v	Ditto, ditto, with "Ensign" Anastigmat Lens, Series II., 3-Foci, f/77, ditto, ditto	7	5	0	8	5 0	11	10	0
1x	Ditto, ditto, with "Ensign" Anastigmat Lens, Series I., 3-Foci, f/5.8, ditto, ditto	7	17	6	9	5 0	12	12	6
1a	Ditto, with "Busch" Detective or Rapid Aplanat Lens.	7	12	6	8 1	17 6	11	17	6
3	Ditto, with "Dallmeyer" Stigmatic Lens, Series II., f/6	11	17	6	14 1	10 0	19	10	0
4	Ditto, with "Goerz" Dagor Double Anastigmamat Lens, Series III., f/6.8	10	17	6	12 1	17 6	17	7	6
4c	Ditto, with "Goerz" Syntor Double Anastigmat Lens, Series ID, f/6.8	8	17	6	10	7 6	14	12	6
5	Ditto, with "Cooke" Lens, Series III, f/6.5	10	7	6	11 1	12 6	16	2	6
8c	Ditto, with "Zeiss" Protar Lens, Series IV., f/6.3	13	7	6	16	9 0	21	0	0
10	Ditto with "Aldis" Anastigmat Lens, Series II., f/6	7	7	6	9 1	17 6	14	7	6
9	Ditto, with "Ross" Homocentric Lens, Series III., f/6.3	9	17	6	11	7 6	16	0	0

HOUGHTONS LTD. \$\$ HIGH HOLBORN.W.C.

The 'Tropical Sanderson' & other models



The "Tropical Sanderson" is a model specially built in polished teak without a leather covering. Intended for use in climates where great extremes in temperature are encountered, this model is strengthened and bound with brass in all its vital parts, and the bellows are attached with brass plates to the body of the camera. All the features of the Regular Model are to be found in the "Tropical Sanderson. The illustration shows the full extension possible with all models invaluable for telephotography and for copying. Prices of "Tropical Sandersons" from £7 15s. (4-plate) complete with Lens, Shutter, 3 Double Backs, Finder, Level, etc.

The very latest "Sandersons" are fitted with these new movements.

Sanderson Hand Cameras are now made in Continental Sizes. See Price List.

New Back Focussing Rack for wide angle work.-This is an extra travelling baseboard built into the body of the camera and entirely independent of the dropping baseboard. It is controlled by a crosshead pinion on the right hand side of the body and enables very short focus lenses to be used & focussed without the slightest trouble.

Rack and Pinion Control to the Rising Front. -- A projecting pinion with rack is now fitted to the rising front and enables the front to be raised or lowered by a ngle adjustment. Like all the other Sanderson" movements it is easily consingle adjustment. trolled from the back of the camera.

Improved Method of attaching

the back of the Camera.—The reversing back of the "Sanderson" is now released by pressing a concealed spring on the top of the body. This spring actuates two automatic catches which hold the back in position.

(These movements are NOT fitted to the Junior "Sanderson" Hand Camera,)

Postcard 'Sanderson' for taking pictures 51 × 31 'Junior Sanderson' a popular price model (3 sizes) {-pl...£5 5 0 De Luxe Model, Highest possible quality and workmanship (all

sizes) ‡-pl. .. £10 0 0

HOUGHTONS LTD. SHIGH HOLBORN.W.C

The "Klito."

The most popular of all magazine plate Cameras.



The "Klito" Camera is the-most popular-Boxform Magazine Hand Camera in the world. Tens of thousands have been sold, and the demand is as big as ever. Each Camera will hold twelve 4-plates, and possesses a "Klito" Shutter with speeds from two seconds to the hundreth part of a second. There are two finders, and all are rack focussing models except Nos. "1," "0," and "oo." No hand Camera at anything like the price offers such extraordinary value for Ask for the money. particulars of "Klito" Cameras, fitted with high grade anastigmat lenses.

"Klito" No. 1 with Rapid Achromatic Lens, Safety Shutter,	
and three magnifiers for focussing	21/-
*" Klito " No. 0 with Rapid Rectilinear Lens, Iris Diaphragm,	
Focussing Magnifiers	21/-
"Klito" No. 1A, with Rapid Achromatic Lens, Rack Focussing	25/-
"Klito" No. 2A, with "Ensign" Symmetrical Lens f/8, Safety	
Shutter, Rack Focussing	31/0
"Klito" No. 2V, with "Ensign" Anastigmat Lens,	
Series II. f7.7, opening front door, Rack Focussing	63/-
"Klito" No. 3, with "Ensign" Symmetrical f/8 Lens, polished	
Mahogany Front, Rack Focussing	42/-
"Klito" No. 6, with Bausch and Lomb Automat Shutter and	
"Beck" Rapid Symmetrical f/8 Lens, Horizontal pattern	63/-
"Klito" No. 6V, with "Ensign" Anastigmat Lens,	
Series II. f7.7, in Bausch and Lomb Automat Shutter	84/-
"Klito" No. 6X, with "Ensign" Anastigmat Lens,	
Series I, f5.8, in Koilos Shutter	117/0

HOUGHTONS LTD. SHIGH HOLBORN.W.C.

BRITISH JOURNAL ALMANAC ADVERTISEMENTS.



No. 000 "Folding Klito," with Rapid Achromatic Lens Ensign Junior			
Auto Shutter and one single metal slide	£1	1	0
No. 0 "Folding Klito," with Symplanat Rapid Achromatic Lens,	4		
"Simplex Auto" Shutter and two single metal slides	1	5	U
No, 1 "Folding Klito," with "Symplanat" Rapid Achromatic Lens, "Simplex Auto" Shutter and two single metal slides	1	10	0
No. 00 "Folding Klito," with Rectimat Symmetrical Lens f/8 and	-	10	v
Simpley Auto Shutter, two single metal slides	1	10	0
No. 2 "Folding Klito," with "Ensign" Symmetrical Lens, f/8, "Sim-	_		
plex Auto" Shutter and two single metal slides	1	17	6
No. 3 "Folding Klito," with "Beck" Symmetrical Lens, f/8 and "Sim-			
plex Auto" Shutter and two single metal slides	2	10	0
No. 3v "Folding Klito," with "Ensign" Anastigmat Lens,	-	40	
Series II, f7.7, in "Simplex Auto" Shutter, two single metal slides	3	10	U
No. 4v "Folding Klito," with "Ensign" Anastigmat Lens, Series II, f7.7, in Bausch and Lomb "Automat" Shutter, two			
series II, J.1, in Bausen and Lomb Automat Shutter, two	4	0	0
single metal slides No. 7 "Folding Klito," with "Ensign" Symmetrical Lens, f/8. and		•	-
two single metal slides	3	3	0
two single metal slides No. 7v "Folding Klito," with "Ensign" Anastigmat Lens,			
Series II. No. 0, 67.7, and "Automat Shutter	4	12	6
No. 7x Ditto, with "Ensign" Anastigmat Lens, Series I.,			
No. 0, f5.8., and "Automat" Shutter		10	
Extra for "Koilos" Shutter for any model in place of "Automat"		15	
Extra Single Metal Slides each		15	
Houghton Envelope Adapter for plates and films	0	19	U



Folding Pocket Camera, strongly constructed and covered in best quality Morocco Grained Leather, best black Leather Bellows, Rising and Cross Front by screw adjustment Double Extension by Rack and Pinion, Bausch & Lomb "Automat" Shutter, adjustable from I sec. to I/Iook sec., and for prolonged Time Exposures, Reversible Finder, Level and Infinity Catch.

F	or l	Plates	or Ro	ll Fi	lms
	41	× 31		58 ×	34
No. II. Complete for Roll Films with "Beck" Sym-	5	s. d.		£ s.	d.
metrical Lens f/8	5	5 0		£ s. 5	0
" IIc. Ditto, with "Busch" Symmetrical Lens f/8	5	7 6 5 0 2 6 7 6		6 7	6
" IIv. Ditto, with "Ensign" Anastigmat Lens f/7'7	8	5 θ			
" IIx. Ditto, with "Ensign" Anastigmat Lens f/5'8	7	2 6		8 12	6
13a. Ditto, with "Aldis" Anastigmat Lens, f/6	6	7 6		7 17	6
" 14a. Ditto, with "Goerz Syntor" Anastigmat					
Lens f/6'8	8	2 6		9 12	6
" 16. Ditto, with "Goerz Dagor" Anastigmat					
Lens f/6'8	9 :	2 6	1	2 2	6
Extra for "Ensign Sector" Automatic Shutter, with					
Antinous Release, in place of Bausch and Lomb					
"Automat" Shutter	0	5 0		0 5	0
Extra for "Koilos" Shutter in place of "Automat"	0 1	5 0		0 15	0
Focussing Screen complete with 3 Slides, in Case	0 1	0 0		0 12	6
This Camera takes "Ensign" Roll Films. Quarter-plate	M	odel "	31 in.		
Post Card Model "31 in. A."					

The "Ensign."

BOX FORM MODELS.

An entirely new series of British-made Box Form Cameras for Daylight Loading Roll Films.



These Cameras are beautifully made, and are built entirely of well-seasoned wood and metal. They are novel in construction, and exceedingly easy to load, the whole of the spool winding mechanism being withdrawn from the outer case, with the side of the Camera, thus greatly facilitating this operation. The strength and solidity of these Cameras is greatly superior to that of other Cameras of similar type.

The covering is of water-proof cloth of excellent quality, practically indistinguishable from leather. The spool winding key is nickelled and all the other fittings are of solid oxydised metal.

A fine quality Achromatic Meniscus Lens is fitted. The Shutter is Everset, and gives Time and Instantaneous Exposures. Ground Glass View Finders of rectangular form and built into the body of the Cameras are provided, and each Camera (except the 21 A. Model) is fitted with a leather carrying handle.

THE " $2\frac{1}{4}$ B ENSIGN." (For Pictures $3\frac{1}{4} \times 2\frac{1}{4}$.) Complete with Single Achromatic Lens, Everset Time and Instantaneous Shutter, with Catch for holding Shutter open for prolonged Time Exposures, two View Finders for upright and oblong pictures, and Diaphragms f/11, f/16, f/22, f/32 10/-	ZiB "ENSIGN."
Complete with Single Achromatic Lens, Everset Time and Instantaneous Shutter, with Catch for holding Shutter open for prolonged Time Exposures, two View Finders for upright and oblong pictures, and Diaphragms f/11, f/16, f/22, f/32	Complete with Single Achromatic Lens, Everset Time, and Instantaneous Shutter and View Finder 5/-
	Complete with Single Achromatic Lens, Everset Time and Instantaneous Shutter, with Catch for holding Shutter open for prolonged Time Exposures, two View Finders for upright and oblong pictures, and Diaphragms fl11, f/16,
Takes pictures as long, but not quite as wide as a quarter- plate. A singularly effective and useful size. Complete with Single Achromatic Lens, Everset Time and Instant- aneous Shutter, with Catch for holding Shutter open for prolonged Time Exposures, two View Finders for upright and oblong pictures and Diaphragms, f/11, f/16, f/22, f/32	THE "2½ ENSIGN." (For Pictures 4½ × 2½.) Takes pictures as long, but not quite as wide as a quarter- plate. A singularly effective and useful size. Complete with Single Achromatic Lens, Everset Time and Instant- aneous Shutter, with Catch for holding Shutter open for prolonged Time Exposures, two View Finders for upright
THE " $3\frac{1}{2}$ ENSIGN." (For Pictures $3\frac{1}{2} \times 3\frac{1}{2}$.) Takes a very useful Square Picture. Camera similar in equipment to the " $2\frac{1}{2}$ Ensign." 21/- THE " $3\frac{1}{4}$ ENSIGN." (For Pictures $3\frac{1}{4} \times 4\frac{1}{4}$.)	THE " $3\frac{1}{2}$ ENSIGN." (For Pictures $3\frac{1}{2} \times 3\frac{1}{2}$.) Takes a very useful Square Picture. Camera similar in equipment to the " $2\frac{1}{2}$ Ensign." 21/- THE " $3\frac{1}{4}$ ENSIGN." (For Pictures $3\frac{1}{4} \times 4\frac{1}{4}$.)

HOUGHTONS LTD. SHIGH HOLBORN.W.C.

The "Ensignette."

(Patent.)

A FOLDING CAMERA FOR THE UPPER VEST POCKET.

Self-Contained. Daylight Loading.

The "Ensignette" is a Vest Pocket Camera built on a new plan. It is new in size, shape and construction. The "Ensignette" is built of metal throughout, opens smoothly and instantly, and is the ideal camera for constant use.

Attractive little pictures are produced that do not necessarily need enlarging to be interesting.



The exact size of the picture taken by the "Ensignette," $2\frac{1}{4} \times 1\frac{1}{2}$ in.

When closed the "Ensignette" measures $3\frac{7}{8} \times 1\frac{7}{8}$ in. and is only $\frac{3}{4}$ in. in thickness. It opens and locks in position for exposure by one simple movement. It is the only really small Folding Camera that is self-contained, and will go into the waistcoat pocket, and it is thinner than any camera in existence.



The "Ensignette" is loaded and unloaded in daylight with Special sixexposure "Ensign" Roll Films.

The "Ensignette" fixed focus printing box will automatically enlarge the pictures to the full standard size postcard $5\frac{1}{2} \times 3\frac{1}{2}$) without loss of

definition. It means that you can produce full size postcard pictures with a Camera that slips into your vest pocket.

The "Ensignette" is fitted with an Achromatic Meniscus Lens with Adjustable Diaphragm openings, f/11, f/16, and f/22. It has an Everset Instantaneous Shutter, with a large and easily controlled release lever.

Time Exposures can also be given, and the Camera will stand easily on a level surface for either oblong or upright pictures.

HOUGHTONS LTD. SHIGH HOLBORN.W.C.

30/-70/-

"The Ensignette."

(Patent.)



When closed, the "Ensignette" is no bigger than a box of wax-vestas.

There is a self-contained brilliant View Finder, a winding key for changing the Film, and an Indicator Window.

The system of Film changing is particularly simple, and can be mastered in a moment.

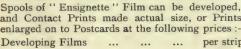
The "Ensignette" is sold in a limp Leather Pocket Case which keeps the Camera clean and free from dust, and takes up little or no room.

ete with

The "Ensignette" has a very handsome appearance, the extending struts are of nickelled phosphor bronze and all the bright parts are of

the same finish.	
No. 1. "Ensignette" Camera, com	ρľ
Achromatic Menicus Lens	
" 1x. "Ensignette" Camera, com	ρl
"Ensign Anastigmat Lens 1/5.6	• •
"Ensignette" Ensign Film Spool	
(6 exposures) each 10d	١.
"Ensignette" Ensign Film Spool	
(6 exposures) per box of 3 2/	6
"Ensignette" Printing Box. To enlarge	
"Ensignette" pictures by daylight to	
Postcard Size 5/	6
"Ensignette" Printing Frame (for 2	
contact pictures) 60	
Developing and Printing Outfit. Complete	
with Book of Instructions. (For	
Developing Spools and making Contact Prints actual size) 5/	ß
,	U
Printing Box Outfit. Complete with Book	
of Instructions (For Developing and Printing Enlarged Prints) 3	/_
	-
"Ensignette" Daylight Developing Tank 7/6	

Spools of "Ensignette" Film can be developed, and Contact Prints made actual size, or Prints enlarged on to Postcards at the following prices :-



per strip of 6 exposures Contact Prints ... per strip of 6 exposures

from separate negatives per doz Enlarged Prints on Postcards ...



The Special Six-Exposure "Ensign" Spool for the "Ensignette."

6d.

6d. 1/6

3/6

OUGHTONS LTD. SHIGH HOLBORN.W.C

The "Victo" Camera Set.



A Field Camera set in which rigidity and serviceable qualities have not been sacrificed for appearance. An outfit for the practical worker and recognised as a standard among Field Cameras.

Here are some the notable features of the "Victo." The Back Framework automatically locks at right angles to the baseboard. A double action similarly locks the lens front as soon as it is at right angles to the baseboard. The camera is therefore very easy to set up. Double swing action by which the lens can be swung upwards or

downwards as desired, and fixed in any position. The Lens Board has rising, falling and side movements. Each movement can be locked separately, The lens can be raised 2^5_8 th inches. The "Victo" has a triple extension governed by Two Separate Pinions, the total extension in the half-plate size being 21^4_2 inches.

Wide front, real leather bellows fixed to the camera front with a metal plate. Focusing screen is fitted with springs for keeping it in position instead of angle catches. Large pinion heads, locking clamp on turntable and many other points of utility.

Every "Victo" set includes a Camera, a named Lens, Thornton-Pickard Roller Blind Shutter, a Double Dark Slide and Tripod Stand.

Prices from 70/- See Price List.

No.	DESCRIPTION.	½-plate.	1-plate.
1	"Triple-Victo" Set complete with "Ensign" Symmetrical Lens f/8, and "Thornton-Pickard" Shutter, etc	£ s. d.	£ s. d. 5 10 0
1a	Ditto, complete with "Ensign" Aplanat Lens, 17.7	3 15 0	5 17 6
2	Ditto "Busch" Rapid Symmetrical Lens, f/8	3 17 6	6 0 0
3	Ditto, "Beck" Rapid Symmetrical Lens, fi8	3 15 0	5 17 6
1v	Ditto ditto, with "Ensign" Anastigmat, Series II. (3 foci.). f/7.7	5 10 0	8 2 6
1x	Ditto, ditto, with "Ensign" Anastigmat, Series I. (3 foci). f/5.8	6 12 6	_
	Extra Double Slides	0 8 6	0 14 6

Teak "Victo" made in all sizes for Tropical use. Post-card and 5×4 models in mahogany or teak. Continental sizes in Mahogany.

HOUGHTONS LTD. SHIGH HOLBORN.W.C.

The "Houghton" Envelope System.

A perfect Daylight Loading System for Plates & Films. This Photograph shows

The Houghton Envelope System provides a means of loading the camera in daylight with either Flat Films or Plates and entirely dispenses with the use of

ordinary dark slides.

The Film or Plate is contained in an ingenious but exceedingly simple light proof envelope made of stiff black paper. As this envelope



only consists of four hicknesses of paper the added weight and bulk is practically negligible. To the user of glass plates the advantages of the Houghton Envelope System will at once be manifest. Its safety and certainty of action has commended it to the serious worker who aspires to get a perfect result from every exposure. Each exposure

can be separately focussed if necessary.



The "Houghton" Envelope Adapter, Models "B" and "C" have a focussing screen built into them in such a way as to dispense with the ordinary focussing screen, attached to the back of a camera, altogether. The Adapter thus not only supersedes Dark Slides, but renders a separate focussing screen unnecessary also. The Adapter is never removed from the camera either for for focussing or re-loading.

Prices complete with self-contained Focussing Screen

Model "B"—Ebonised wood, leather-covered, for all Cameras using wooden Dark Slides, including "Sandersons" and "Tudors,"

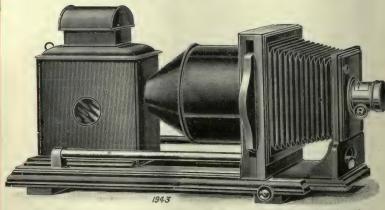
Model "C"—Metal, leather-covered, for all "Folding Klitos," "Ariels" (½-pl.), and Roll Film "Ensigns" (½-pl.)

Size.	Model "B"	Model "C" Each.	Plate Envelopes New Model (Unloaded). Per Dozen.	Loaded with	"Ensign" Flat Cut Films (Thick), for Reloading. Packets of 10.
‡-plate 5 × 4 Post Card ½-plate 9×12 c/m	15 0 18 6 18 6 25/0 16 6	15.0	3/6 4/6 4/6 6/0 4/0	3/0 4/6 5/6 6 0 5/0	1/8 2/6 2/6 3/9 2/3

Illustrated Booklet on the "Houghton" Envelope System free on application.

JGHTONS LTD. SHIGH HOLBORN.W.C

The "Tudor" Enlarging Lantern.



The "Tudor" Enlarging Lantern is scientifically constructed and capable of turning out work of the highest technical excellence. The baseboard is of solid mahogany, and extends by rack and pinion. The pinion head in its normal position is thrown out of gear, and this allows the baseboard to be easily moved backwards and forwards to obtain the correct adjustment. The pinion head can then be pulled out, and the final focussing done with the rack and pinion movement.

The body, chimney and condenser hood are of Russian iron. The condenser in a solid brass mount is of excellent quality. Lens front and condenser carrier are of solid polished mahogany. The negative carrier is shaped so that the picture can be regulated to the best advantage, the curved base making it possible to correct lines that are out of the perpendicular. A rising front lens panel is fitted, and the portrait lens is of specially selected quality, with "Waterhouse" diaphragms and rack focussing adjustment.

Model A. Small Body Lantern with Tall Chimney, with Incandescent Gas Fittings or Oil Lamp.

Model B. Square Form Lantern with Cowl (as illustrated) for Incandescent Gas or Electric Arc Lamp—tray only supplied.

No. I. Quarter-plate, complete with 52-in. Condenser and best quality	£4		
Extra for Aldis Lens Series II. No. 2 instead of Portrait Lens		19	U
No. 2. 5 × 4 or Post-card size, complete with 6½-in. condenser. and best			
quality Portrait Lens	5	0	0
Extra for Aldis Lens Series II. No. 3 instead of Portrait Lens		10	0
No. 3. Half-plate, complete with 81-in. Condenser and best quality			
Portrait Lens	7 2	0	0
Extra for Aldis Lens Series II. No. 4 instead of Portrait Lens	2	2	6
Extra for Sol Lamp	1	8	0
Extra for Incandescent Burner and Reflector	0	6	9
		-	
SPECIAL NOTE.—Please always state which Model, A or B, Lantern is re-	quire	ed, a	ind

SPECIAL NOTE.—Please always state which Model, A or B, Lantern is required, and whether for Gas, Oil or Electric Light.

Combination Emarging Lamern for 4-plate cameras	 0 0 1	22	v	v
"Oueen" Enlarging Lantern, with 52-inch condenser	 	2 1	7	6
"Victo" Enlarging Lantern with 52-inch condenser	 	3	7	6
"Sanderson" Enlarging Lantern for \(\frac{1}{2}\)-plate "Sandersons"	 	2 1	0	0
"Imperial" Enlarging Lantern for 1-plate negatives	 	5 1		0
"Empress" Enlarging Lantern for 1-plate negatives	 	2 1	2	6

HOUGHTONS LTD. SS HIGH HOLBORN.W.C.

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The "Klito" Daylight Enlarger.

The "Klito" Enlarger is made entirely of wood, and can be taken to pieces as shown in the illustration, and packed so that it takes up only half the space.

The covering is a hard leather grain material, and there is a leather handle for carry-When set up the smaller end locks on to the base by means of two metal catches. There is a dark slide for the bromide paper, and it should be stated that this dark slide can be entirely withdrawn, so that there is no necessity to take the whole Enlarger into the dark room when the picture is to be developed. The panel of the dark slide folds back out of the way when the exposure is being made. There is a plunge shutter which shows when the lens is open or closed.



The Lens supplied is a Doublet of excellent definition, with excep-tion of Nos. 5a and 6, which are fitted with single achromatic Lenses of special quality.



Prices of the "Klito" Enlargers complete with Wooden Dark Sildes.

No. 2 "Klito" Enlarger, 3	-plate to whole-plate, and 31 × 21 to 12-plate	15/-
No. 3 "Klito" Enlarger,	5×4 to 10×8 , and $\frac{1}{4}$ -plate to whole plate	21/-
	-plate to 12×10 , and $3\frac{1}{2} \times 2\frac{1}{2}$ to $8\frac{1}{2} \times 6\frac{1}{2}$	
No. 5 "Klito" Enlarger,	$\times 4$ to 12 \times 10, and $\frac{1}{4}$ -plate to 10 $\times 8$	30-
No. 5a "Klito" Enlarger,	Post-card size to 12×8	32/6
to 10 × 8		37/6



Built entirely of wood. Separate wooden dark slide with draw out shutter. No. 2 Briton Daylight Enlarger (\$\frac{1}{4}\$-plate to whole-plate, and \$3\frac{1}{4} \times 2\frac{1}{2}\$ to \$\frac{1}{2}\$-plate) ...
No. 4 Briton Daylight Enlarger (\$\frac{1}{4}\$-plate to \$12 \times 10\$, and \$3\frac{1}{2} \times 2\frac{1}{2}\$ to whole-plate) ...

15-No. 5a Briton Daylight Enlarger (5\frac{1}{2} \times 3\frac{1}{2} \to 12 \times 8) 21/- AN ENTIRELY NEW KIND OF PAPER WHICH CAN BE DEVELOPED IN SUBDUED DAYLIGHT OR ORDINARY ARTIFICIAL LIGHT, AND YET GIVES RESULTS LIKE P.O.P.

"Ensyna" is a new paper that will give prints like P.O.P. by artificial light It requires no toning and no troublesome manipulation. A long range of beautiful tones are obtainable—from rich purple to warm sepia. The tone is entirely controlled by the exposure. No process could be simpler. Prints can be made by daylight or artificial light. No dark room or yellow light is required. The whole process—printing, developing, fixing, and washing—takes only 5 minutes.

Printing takes about 1 to 5 seconds by daylight, or 20 to 60 seconds by gaslight. The

prints develop up in less than 2 minutes in beautifully rich tones, giving results that are

indistinguishable from the finest gold or platinum toned prints.

Prints only require 30 seconds to fix, and 2 minutes washing is all that is necessary

before prints are hung up to dry.

It is practically impossible for anyone to go wrong with "Ensyna" printing. No flashing up of the image in the developer. The picture builds up gradually and definitely and loses nothing in the fixing bath.



- "ENSYNA" is made with either glossy.
- Carbon, or matt surface.

 "ENSYNA" paper is sold in 6d. and

 1s. packets in all the popular sizes.

"ENSYNA" postcards are put up in 6d. and 1s. packets and also in

packets of 100 and 144.
"ENSYNA" paper in cut sizes is put up in gross boxes for professional use,

and in sheets 24½×17.
"ENSYNA" is developed with a

special patented developer called "Ensynoids." "Ensynoids" developer is sold as follows (it is essential for developing "Ensyna" paper).

- "ENSYNOIDS" in Tubes—12 pairs of "Ensynoids," each pair making 8 ozs. of developer... In Cachets -a pair of "Ensynoids' making 8 ozs. of developer .. 2d. Boxes of 6 pairs of "Ensynoids" 1s.
- "ENSYNOID" Liquid Developer (one solution), sufficient to make 24 ozs. developer, per bottle. 6d.
- "ENSYNA" Acid Fixing (specially recommended). In tins-to make 60 ozs. of acid Fixing solution

DUGHTONS LTD. 89 HIGH HOLBORN.W.C.

"Ensyna."

There are two grades of "Ensyna" (Ordinary and Vigorous; both equally suitable for printing from good average negatives, either by daylight or artificial light.

The **Ordinary** (or **Soft**) **Grades** are specially suitable for printing from strong and plucky negatives and are the best for Artificial light printing.

The **Vigorous Grades** are specially suitable for printing from thin and weak negatives, and are the best for Day-light Printing.

BOTH GRADES ARE MADE WITH GLOSSY, MATT, AND CARBON SURFACES.

SIZE OF PAPER. PRICES.					E C	F P.	APER:			PRICE	ES.
216 × 13 · · · · · · · · · · · · · · · · · ·	36 24 nsignette 20 18 12 16 10	"	for 6d. 6d. 6d. 6d. 6d. 6d. 6d.	5 5 5 6 6 8 8 10 12 15	××××××××	4 3 ¹ / ₂ -4 4 ³ / ₃ -4 4 ³ / ₂ -1 6 ¹ / ₂ -8 10 12		 	16 p 16 14 10 6 6 4 4	ieces fe	or I/- I/- I/- I/- I/- I/6 I/6 2/3

What some Photographic Experts think of "Ensyna."

The Editor of "Photography," says -" 'Ensyna' might be regarded as the feature of 1908. Certainly it is hard to forecast the position which this wonderfully simple and fool-proof paper may attain."

The Editor of the "Amateur Photographer," says - "The most difficult to please can hardly want a paper that will do more."

The Editor of the "British Journal of Photography," describes "Ensyna" as a "remarkable addition to photographic printing processes," and says that "Ensyna" is a product totally different from any other on the market."

"The whole process is novel, convenient, and highly efficient."—The Daily Graphic

"Unquestionably a new power is placed in the hands of the photographer by the 'Ensyna' Paper.....May work almost as wide spread revolution as did the coming of the Gelatine printing papers a few years ago."—The Westmister Gazette.1

"'Ensyna,' the new process that is upsetting all one's preconceived notions of photographic procedure."-Mr. FOSTER BRIGHAM in The Amateur Photographer.

"We are quite convinced that its introduction will mark one of the historic events in connection with photography."—The Photographic Monthly.

"The 'Ensyna' print over exposed 700 times will usually, or frequently, develop quite satisfactorily, especially if the developer is somewhat weakened by dilution with water."—Mr. THOMAS BOLAS, F.C.S., F.L.C., etc., etc., in The A.P. and P.N.

"Ensyna" will probably revolutionise photography.....enormous possibilities lie in the invention. We rejoice that it is a British product, and pronounce it a triumph."—The Photographic Dealer.

Even the "Walrus" of "Photography" cannot find any fault with "Ensyna."—"Never till the other day have I found a printing paper with which I failed to produce the most appalling and heart rending results with ease and certainty. The new paper I was asked to try was described by the Editor as being fool-proof. I believe it is so. It has baffled me. It withstood the most horrible liberties I could devise."

HOUGHTONS LTD. SHIGH HOLBORN.W.C

The "Ensign" Development Tank.

A New and Exceedingly Simple Tank for Developing Plates in Daylight.

The "Ensign" Development Tank is absolutely free from all complications. It is made entirely of brass, very heavily nickel plated. The inner rack is removable—a great convenience for loading. The action of clamping on the lid renders the tank lightight, and water-tight. The lid of the tank is fitted with a soft rubber pad into which the top edges of the tank are pressed by the action of clamping. The locking clamps are ingenious but very simple, and have no

ENSIGN DEVELOPMENT

TANK

loose parts.

The developer is introduced through a nozzle fitted with a screw cap. This nozzle opening is protected by the light trap, so that there is no risk of fogging the plates while the developer is being poured in.

Once the plates have been put into the tank in the dark room, the whole process of development is conducted in daylight. The developer is poured into the tank in daylight and the plates can be washed before the tank is opened. Fixing can be done in daylight, when once the plates have been washed free of developer, or, if the tank is well washed afterwards, the negatives can be fixed in the tank right away. No liquids need be used in the dark

room at all.

The simplicity of the "Ensign" Tank has reduced the cost of manufacture and enabled us to sell it at a low price.

It is peculiarly well designed and adapted for constant use. It can be stood upright on either end, has no unnecessary or flimsy fittings, and will outlast any other form of Developing



Each Tank is complete in itself. New rubber pads need only be purchased in case of damage by accident, or after long use. A separate tank is recommended for fixing, but is not necessary.

No.	0.	To develop 6	plates,				6/6
99	I.	1.7	9.9	41 ×	31		7.6
9.9	2.	21	9.0	5 ×	4	• •	106
9.9	3.	19	91	63 ×	37		126
11	4.	2.2	2.9	U3 ^	46	* *	LAU

HOUGHTONS LTD. # HIGH HOLBORN.W.C

SHEW Cameras:—THE BEST.

The 'EUXIT'

THE IDEAL VEST POCKET CAMERA.

 $3\frac{1}{2} \times 2\frac{1}{2}$. Fitted with Focussing Cooke Lens and Compound Shutter.

Complete in Case and six slides in Purse.

Price £9 9s. Od.



"EUXIT," OPEN.

XIT Series of Folding Cameras



are the best on the market. They are of the very highest workmanship, reliable in every detail, and fitted with the Best Optical Equipment, exceedingly light, and of small dimensions.

Made expressly for Tourists and Sportsmen.

TO TAKE EITHER PLATES OR FILMS.

IN FIVE SIZES :-

 $3\frac{1}{2} \times 2\frac{1}{2}$, $\frac{1}{4}$ -plate, 5×4 , Postcard, and $\frac{1}{2}$ -plate.

"EUXIT." CLOSED.

Mahogany, bound with Aluminium, or covered with real Black Morocco, and all fitted with horizontal and vertical rising front.

J. F. SHEW & CO.,

88, Newman Street, LONDON, W.,

Specialists in Photographic Apparatus, Experts in Reflex Cameras. Patentees and Sole Manufacturers.

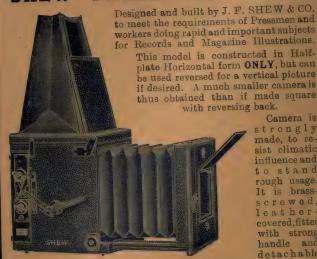


HALF-PLATE. CLOSED.

SHEW me a SHEW.

I will have NONE OTHER.

SHEW PRESS REFLECTOR.



Camera is strongly made, to resist climatic influence and to stand rough usage. It is brassscrewed, leathercovered, fitted with strong handle and detachable

shoulder sling. The special features are: Rising Front; Rack focussing from Right and Left side; Three-fold hood; Mirror, silvered on surface, automatically re-set after each exposure; no capping of shutter necessary; the cup front is fitted with detachable panels for the insertion of other lenses.

Models A and B are fitted with the Goerz Anschutz Tropical Model Quick-Wind Shutter, speeds 10th to 1000th sec., adjusted from outside, and } sec. to 5 secs. automatic.

Models C and D .- Fitted with the New Anschutz Shutter, Slit adjustable from outside, and self-capping blind.

						£13 1		0
Model A.	Double	Extension,	63 1	o 14 in., with	3 backs	15 1		
" В,	Triple		り方	60 20 111.,	19	17 1		
", č.	Double	11			99			
" D	Triple	**	73	to 23½ in.,	22	 19 1	U	v

ENSES RECOMMENDED.

LENSES	KECOMME
Goerz 18, F/4.8.	Zeiss Tessar, F/4·5.
Goerz Dagor, S. III., F/6.8.	Voigtlander Heliar, F/4·5.
Voigtlander Collinear, S. III., F	The Euryplan, S. II., F/6·5.

CCESSODIES

DOUBLE BACKS (extra set of 3) DAYLIGHT CHANGING DARK SLIDE, with SHEW special 2	19	u.
DADK SLIDE with SHEW special		
DAVI IGHT CHANGING DARK SEIDE, "118 STEEL	2	0
side hinge and slide bolt and six envelopes 2	2	u

For Further Particulars see page 23 of List.

THE SHEW FOCAL PLANE REFLECTOR.

Square, with Reversing or Rotating Back.



THE MOST PERFECT AND RELIABLE REFLEX CAMERA.

Fitted with Anschutz Model A Shutter. speeds adjusted from outside, from both to adout sec., and automatio time exposures j sec. to 5 secs.; ball or trigger release, and speed scale attached.

New "Everset" Mirror reduces the movements necessary for exposure to a minimum: one movement only raises the Mirror, releases the shutter, and resets Mirror in position.

Full size View Finder (shows exact view taken), with Rotating Diaphragm, Rising Front, Rack Focussing, and Double Extension.

The Camera is made of seasoned Spanish mahogany, brass screwed throughout, to withstand climatic influence and rough usage. It is covered with good leather, has strong handle and detachable shoulder sling. A sunk level is fitted and a bush for tripod use.

The Outfit consists of camera, as above, with 3 Aluminium bound Rapid Changing Xit Double Backs, or the

Premo Film Pack Adapter and Two Xit Double Backs and Focussin	
Tremo Prim Lack Adapter and I wo Ait Double Ducks and I ocussing	2
Screen.	
Complete, as above, but without 2-plate. 5×4 3-plate	
Lens £11 11 0 £13 13 0 £14 14	
With Goerz Dagor, S. III., F/6.8 6in. 17 17 0 7in. 20 18 0 81in. 23 9	0
	U
(The best Universal Lens.)	_
With Zeiss Convertible F/6.3 6in. 20 15 0 8in. 24 16 0 94in. 29 6	0
Zeiss Tessar, IIB, F/6·3 16 11 0 20 13 0 23 4	
,, Ic, F/4·5 18 1 0 21 13 0 24 14	0
The Volgtlander Heliar, F/4.5 6in. 17 16 0 7in. 21 18 0 9ain. 28 14	n
The New Euryplan, F/5.6 18 6 0 19 3 0 21 19	
Any of above Lenses, if purchased from us, fitted free of charge.	
Fitting and adjusting purchasers' own lenses from 10s. 6d, extra.	
0 7 02	
Double Backs, extra set of three £1 5 0 £1 10 0 £1 15	0
Daylight Dark Slide, inter-	
changeable with the Xit	
backs, including 6 enve-	
lopes 1 7 6 1 12 6 1 17	C
Dark Slide Envelopes, per	
dozen 0 15 0 0 18 0 1 4	
$\frac{1}{2}$ -plate. 5×4 $\frac{1}{2}$ -plate	
Revolving Back, extra 0 15 0 0 15 0 1 1	0

SHEW me a SHEW. I will have NONE OTHER.

SHEW DELTA REFLECTORS.

Made in Two Models.

The Delta Reflector is the smallest Reversing-back Reflector made. The Quarter-plate has a focal range of 5 to 8 ins., and weight only 21 lbs.

The Delta has Rack Pocussing, Double Extension Rising Front, Metal Shutter behind lens, regulated from outside, Removable Hood. It is built of Spanish mahogany, brass screwed, and covered real leather. The back has Shew's Universal Fitting, to take double backs, Film Pack Adapter, Daylight Changing Dark Slide, or Daylight Roll Film Holder, all interchangeable to the one fitting.

Camera, fitted with Cooke Anas-tigmat, F/6.5, with Iris dia-phragms, arranged to read from the face, in special mount, three Double Backs, and Focussing

Screen Fitted with Aldis Anastigmat, F/6 Camera and Accessories named, ex-clusive of lens

 5×4 . 3-plate.

£8 10 0 £10 10 £12 12 10 4 10 0 7 7

The Focal Plane Delta.

This Camera is fitted with the new pattern Three Aperture Focal Plane Shutter, with all adjustments from outside. Speeds of the total to see. Pneumatic and Finger Release, and Time Exposure. This Shutter is reliable and very simple, with speed tablet showing at a glance working speed of shutter. In this, as in our other models, the

plate is only uncovered during exposure. No capping of shutter or lens necessary. Recessed Lens front, and

The Focal Plane Delta, Complete with three Double Xit Backs,

5 x 4. 1-plate. £7 7 0 £8 8 0 £10 10 0 With Goerz Syntor, F/6.8, $\frac{1}{2}$ -plate. 5×4 . $\frac{1}{2}$ -plate.

With Zeiss Tessar, F/6.3, 2-plate. 5 × 4. 2-plate. £12 7 0 £15 8 0 £19 0 0

£11 7 0 £13 3 0 £17 0 0

The lenses of any other make fitted to order. If purchased through us, free of charge. Fitting and adjusting customers' own lenses, from 7/6, according to work required.

SAY TO YOUR DEALER-

I will have NONE OTHER." "SHEW me a SHEW. LISTS FREE ON APPLICATION.



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GOERZ LENSES & CAMERAS

THE BRITISH JOURNAL ALMANAC ADVERTISEMENTS.



Taken with the Goerz-Anschutz Folding Camera.

C. P. GOERZ Optical Works, Ltd.,

I to 6 HOLBORN CIRCUS, LONDON, E.C.

All prices subject to alteration without notice.

Complete Catalogue on Application.
Telegrams "Photopsia, London."

1910 Catalogue ready in March.
Telephone 1696 Holborn.









GOERZ
"
"
Tanto"
F.6.3 to F.8.

(Singles F.12.5)
The Goerg "Pantar" Angetigmat will be found to have

The Goerz "Pantar" Anastigmat will be found to have the great covering power and the fine definition which have been characteristic of the older series of Goerz Lenses, and made them so popular among photographers.

Two single combinations of different foci may be combined to form a doublet, as shown in the second of the following tables. Such a combination will be found of the greatest advantage when used in conjunction with a camera having a long bellows extension.

No.	Combin	of Single nations. thes.	Focus of complete Leus. In.	Aperture.	For Plates.	Mount No.	PRICES.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	6 7 9½ 7 9½ 11¾ 14 14 14 16½ 16½ 19	6 6 6 7 7 7 7 9 9 1 1 1 1 1 4 1 4 1 4 1 1 6 1 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	38 38 44 44 45 45 45 45 45 45 45 45 45 45 45	F/6·3 F/6·3 F/7·7 F/6·3 F/7·2 F/6·3 F/7·2 F/6·3 F/6·3 F/6·3 F/6·3 F/6·3 F/6·6	3½ × 2 3½ × 2 3½ × 3½ ½ ½ ½ ½ ½ ½ ½ ½ ½ ½ ½ ½ ½ ½ ½ ½	I I I I I I I I I I I I I I I I I I I	\$\cdot \text{s. d.}\$ 6 15 0 7 0 0 7 5 0 7 5 0 7 10 0 8 10 0 7 15 0 9 10 0 9 10 0 10 5 0 11 0 0 12 15 0 14 15 0 14 0 0 18 0 0

The Lenses cover at their full aperture larger plates than the above, but are recommended for use with the sizes specified.

Particulars of sets of Pantar Lenses and single combinations in complete catalogue free on application.

The LENS for SPEED.

THE GOERZ F.4.5 to F.5.5.

A lens unsurpassed for Photography at high speeds and in dull weather.

This Series of Lenses is specially adapted for instantaneous work of any kind, and for the Shortest exposures (1000th of a second or less), Portraiture in the Studio or ordinary room, Lantern and Cinematograph Projection, Enlargements, Reproductions, Three-colour Work, Telephotography, as well as for Landscapes, and Architecture, and in all cases where an extremely wide angle is not required.

The apertures of the different lenses are as follows-No. 000, F/4.5; No. 00 to No. 2, F/4.8; No. 3 to No. 5, F/5; No. 6 to No. 8, F/5.5.

The BACK COMBINATION can be used with a small stop, and has

about double the focus of the complete lens.

For Stereoscopic work the Lenses can be accurately paired at an extra charge of 8/-.

No	Equiva- lent Focus.	Plate (with smaller stops.	Price with Iris Diaphragm.	Price in Special Focussing Mount.	Price in Sunk Mount for Reflex Cameras.
000 00 0 1 2 3 4 5 6 7 7a 8	$\begin{array}{c} 2\frac{8}{5} \\ 3\frac{1}{5} \\ 5 \\ 6 \\ 7 \\ 8\frac{1}{4} \\ 90\frac{1}{3} \\ 12 \\ 14 \\ 16\frac{1}{2} \\ 19 \\ \end{array}$	$\begin{array}{c} 2\frac{1}{4} \times 1\frac{1}{2} \\ 3\frac{1}{2} \times \frac{1}{2} \\ 4\frac{1}{4} \times 3\frac{1}{4} \\ 4\frac{1}{4} \times 3\frac{1}{4} \\ 6\frac{1}{2} \times 4\frac{3}{2} \\ 7 \times 5 \\ 8 \times 5\frac{1}{2} \times 6\frac{1}{2} \\ 9 \times 7 \\ 10 \times 8 \\ 12 \times 10 \\ 15 \times 12 \\ \end{array}$	2¾ × 2 4 × 2¾ 5 × 4 6½ × 4¾ 8½ × 6½ 9 × 7 10 × 8 12 × 10 14 × 11 16 × 14 20 × 16	\$\frac{8}{4}\$ 15 0 0 5 5 0 0 5 10 0 0 7 10 0 0 12 10 0 0 17 10 0 0 17 10 0 0 12 10 0 0 17 10 0 0 18 15 0 0 33 15 0	£ s d 5 10 0 6 0 0 6 5 0 0 8 5 0 10 5 0 13 10 0	5 5 0 5 10 0 6 10 0 7 10 0 9 5 0 12 10 0

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The FINEST UNIVERSAL LENS.

GOERZ

"DO F.6.8.

up to No. 7. Higher numbers F/7.7.

Highly suitable for Portraits, Groups, Instantaneous Work, and Architecture. The "Dagor" permits the use of the largest stop without diminishing the sharpness of the image at the extreme margins of the plate up to an angle of 70°. By the use of a smaller stop an angle of 90° is covered. Definition, brilliancy, and flatness of field are uniform all over the picture.

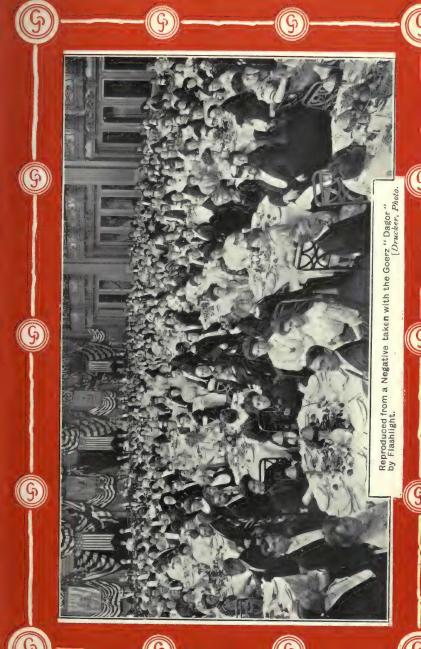
The back combination can be used alone and has about twice the focal length of the complete lens.

Each Goerz "Dagor" supplies:-

- 1. A RAPID LENS for general purposes.
- 2. A WIDE ANGLE LENS for interiors.
- 3. A LONG FOCUS LENS for distant objects.

No.	Equiva- lent Focus.	Size	of Plate sha	rply	Price with Iris Dia- phragm.	Price in Special Focussing Mounts.	in Sunk Mount for Reflex
	T OCUS.	full aperture.	F/16.	F/62.	£ s. d.	£ s. d.	Cameras. £ s. d.
0000	12	18 x 15	2 x 2	2 x 23	4 15 0	****	_
000	28	25 x 25	2½ x 3	23 x 31	4 15 0	-	-
00	$3\frac{1}{2}$	31 x 31	31×41	4 x 5	5 0 0	5 15 0	5 0 0
0	5	31 × 41	4 x 5	43 x 61	5 5 0	6 0 0	5 5 0
1	6	4 x 5	43 x 61	5 x 8	6 5 0	7 5 0	6 5 0
2 3	7	43 x 61	5 x 8	7 x 9	7 5 0	8 5 0	7 5 0
3	81	5 x 8	6½ x 8½	8 x 10	8 15 0	9 15 0	8 15 0
4	91	6½ x 8½	7 x 9	10 x 12	10 10 0	11 15 0	10 10 0
5	103	7 x 9	8 x 10	12 x 15	12 15 0		_
6	12	8 x 10	10 x 12	16 x 18	15 5 0		_
7	14	10 x 12	12 x 15	18 x 22	19 15 0	_	_
7.3	161	11 x 14	13 x 17	21 x 25	26 0 0	_	

For Stereoscopic views the lenses are accurately paired at an extra charge of 8/-Full Catalogue containing particulars of longer foci "Dagors" Process Lenses, the Hypergon Wide-Angle Lens (135°), the Photo-Stereo-Binocular, etc., sent free on application.





F.6.8.

FINEST LOW-PRICED ANASTIGMAT.

The Goerz "Syntor" is a thoroughly good all-round lens, made with the same care and precision as the other series of Goerz Lenses, and giving that crispness of definition which is typical of all our lenses. It is fast, will give you good snapshots, and is excellent also for stand work. The single combinations can be used alone as long focus lenses. The "Syntor" has not quite the same covering power as the Goerz "Dagor," but more than covers the plate for which it is listed, and will allow of the rising front being used without cutting off. A Cheap, Excellent Lens for Hand-Cameras, and can be recommended with the Utmost Confidence.

No.	Equivalent Focus. Inches.	For Plates. Inches.	Price in Ordinary Mount.	Price in Special Focussing Mount.	Price in Sunk Mount for Re- flex Cameras.
0 1 2 3	5 6 7 81	4½ x 3½ 5 x 4 6½ x 4¾ 7 x 5	£ s. d. 3 5 0 3 15 0 4 10 0 6 5 0	£ s. d. 4 0 0 4 10 0 5 5 0 7 0 0	£ s. d. 3 10 0 4 0 0 4 15 0 6 10 0

The "Syntor" F/6.8 is well corrected for chromatic and spherical aberration, and for astigmatism. The angle covered at F/6/8 is 64°; by the use of smaller stops this angle can be increased to 70°. A plate having a base line equal to the focal length of the "Syntor" used is excellently covered. Where a considerable displacement of the lens from the centre is desired the

next longer focus is recommended. For Stereoscopic work the lenses can be accurately paired at an extra charge of 6/-.

GOERZ LENSES IN SHUTTERS

The Goerz Lens can be fitted to practically all the popular Between-Lens Shutters. Lenses up to $8\frac{1}{4}$ inches focus are usually in stock ready fitted to shutters, but in any case can be fitted in two or three days. In those cases where a charge for fitting to the camera is made, an estimate of cost will be given, if desired.

"Dagor." F/6.8.

No.	Focus. Inches.	With Goerz Sector Shutter.	With B. & I Automat Shutter.	With B. & L. Volute Shutter.	With Compound Shutter.	With Koilos Shutter.
0 1 2 3 4 5 6	5 6 7 84 91 102 12	£ s. d. 8 15 0 9 15 0 10 15 0 12 5 0 15 0 0 17 5 0 19 15 0	£ s. d. 6 6 0 7 6 0 9 10 0 11 12 0 13 7 6 15 12 6 18 2 6	£ s. d 8 17 0 9 17 0 10 17 0 12 12 12 6 14 7 6 16 12 6 19 9 0 23 19 0	£ s d. 7 0 0 8 5 0 9 5 0 11 3 0 12 18 0 15 15 0	£ s. d. 7 0 0 8 5 0 9 5 0 11 3 0

"Celor." F/4.5-5.5.

No.	Focus. Inches.	With Goerz Sector Shutter.	With B. & L. Automat Shutter.	With B. & L. Volute Shutter.	With Compound Shutter.	With Koiles Shutter.
0 1 2 3 4	5 6 7 81 91	£ s. d. 9 0 0 11 0 0 12 0 0	£ s. d. 6 11 0 8 15 0 10 7 6 12 2 6	£ s. d. 9 2 0 10 7 6 11 7 6 13 9 0 16 14 0	£ s. d. 7 10 0 8 18 0 10 10 0 12 10 0	£ s. d. 7 10 0 8 18 0 10 10 0

"Syntor." F/6.8.

No. Focus. Inches.	With Goerz Sector Shutter.	With B. & L. Automat Shutter.	With B. & L. Volute Shutter.	With Compound Shutter.	With Koilos Shutter.
0 5 1 6 2 7	£ s. d. 6 15 0 7 5 0 8 0 0	£ s. d. 4 6 0 4 16 0 6 15 0	£ s. d. 6 17 0 7 7 0 8 2 0	£ s. d. 5 0 0 5 15 0 6 10 0	£ s. d. 5 0 0 5 15 0 6 10 0

Prices of "Pantars" in Between-Lens Shutters on Application,







GOERZ TELEPHOTO LENSES

These lenses are of an entirely new construction, have a definition and covering power unequalled by any other telephote lens, and are of the greatest service for photographing subjects inaccessible to the camera with the usual lens.

The telephoto attachment consists of the negative lens and tube, prices of which follow, and these must be combined with a positive lens, generally the one in ordinary use on the camera.

COMBINATION OF							Price of Negative Lens with tube.
For following Goerz or similar Lens.					Focus.	Lens Focus.	with tube.
Dagor Syntor Celor Dagor Syntor Celor	QUAI	**************************************		No. 0 ,, 0 ,, 0 ,, 0 ,, 0 ,, 0 ,, 0 ,, 0	484 484 484 484 484 484 484	1120-522 122 122 122 122 122 122 122 122 122	£ s. d. 4 0 0 4 0 0 4 5 0 4 15 0 4 15 0 4 15 0
Dagor Syntor Celor Dagor Syntor Celor				,, 1 ,, 1 ,, 1 ,, 1 ,, 1	6 6 6 6 6	2 2 2 3 8 3	4 15 0 4 15 0 5 0 0 5 15 0 5 15 0 5 15 0
Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Dagor Syntor Celor Syntor Celor Syntor Celo	HA	LIF PLA		;; 2 ;; 2 ;; 2 ;; 2 ;; 2 ;; 2 ;; 2 ;; 2	77777777778888888888888888888888888888	9107-9107-910 24 24 24 35 35 35 35 35 35 35 35 35 35 35 35 35	55 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Booklet on Telephotography, 6d. post free.

GOERZ FOLDING



Camera opened, but with protecting base removed.

Type strument Embodying the Advantages of the Reflex with the Portability of the Folding Camera.

The Goerz Folding Reflex is made for one size of plate only—the pop-ular 5 × 4. When folded, the depth from back to front is 33ths inches only. Simply lifting up the lenspanel opens and extends the camera with the lens focussed, and the mirror and hood in position ready for use. One movement only is required. Closing the camera is effected with similar facility.

The camera is not fragile, but when set up is as rigid as the box pattern reflex. It has all the advantages of the latter, and differs from it only in being compact and light enough to carry without inconvenience.

A Focal Plane Shutter-the latest self-capping Goerz-Anschutz pattern giving time and bulb exposures, as well as automatic and instantaneous exposures, from 5 seconds to 1200th second, is fitted.

Either the Goerz "Dagor" F/6.8 or "Celor" F/4.8 can be supplied with the camera.

The Goerz Folding Reflex is provided with a Reversing Back. For plates or films.

Prices (5 × 4 only).	£	s.	d.
Goerz Folding Reflex, fitted with Goerz "Celor" F/4'8, without slides or accessories	23	0	0
Goerz Folding Reflex, fitted with Goerz "Dagor" F/6 8, without slides or accessories	23	0	0
Double Dark Slides, each Plate Changing Box for 12 plates	2	0	0
Daylight Cartridge Roll Holder Goerz Film Pack Adapter (for Premo Film Pack)		10 0	0
Leather Case for Camera, with 6 dark slides (or changing box, or roll holder, or film pack adapter) Light Wooden Stand	1	2	6
Light Wooden Stand	U	10	U









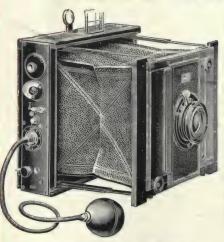




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GOERZ-ANSCHUTZ

FOLDING CAMERA.



Slit altered, and all speeds adjusted from the outside.

The latest model of the Goerz - Anschutz Folding Camera is fitted with an improved form of focal plane shutter, giving speeds from 1/1200th second to 5 seconds all regulated from the outside.

The shutter is self-capping, so that the plate or film is not exposed during setting. Exposures can be altered before or after shutter

set.

The Camera can be fitted with Telephoto Lens and extension for use of Single Combination of Lens.

PRI	CE	LIST.	

	PRICE	LIST.		
For Plates Goerz-Anschutz Folding Camera, complete with	$4\frac{1}{4} \times 3\frac{1}{4}$	5×4	Postcard 10×15 cm. 5½×3½	$6\frac{1}{2} \times 4\frac{3}{4}$
Goerz "Celor" Lens F/4.8, Three Double	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Dark Slides and Case	13 19 0	14 19 0	16 13 0	18 2 0
Do., do., with Goerz "Dagor" F/6'8, do	13 14 0	14 19 0	16 13 0	18 2 0
Do., do., with Goerz "Syntor" F/6.8, do	11 14 0	12 4 0	13 18 0	15 2 0
Extra Double Dark Slides, each	0 12 0	0 12 0	0 14 0	0 16 0
Plate Changing Box for 12 Plates	2 0 0	2 0 0	2 5 0	2 8 0
Roll Holder	1 10 0	1 10 0	1 15 0	2 0 0
Film Pack Adapter	1 0 0	1 0 0	1:3 0	1 5 0

COMPLETE LIST ON APPLICATION.













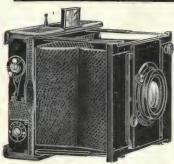
Illustrations Bureau.

Taken with the Goerz-Anschutz Folding Camera.

(§)——(§)——(§)—

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GOERZ-ANSCHUTZ



TROPICAL AND PRESS CAMERA

Similar to the ordinary Goerz-Anschutz Folding Camera but specially adapted for Tropics and rough usage.

The bellows is of Russian leather, to withstand the attacks of insects; special impregnated wood is used so that bending or warping is practically impossible; steel is almost entirely discarded in favour of brass and German silver, and the steel spring of the shutter is so heavily coppered and nickelled as to possess all the non-rusting properties of those two metals.

The Goerz-Anschutz Focal-Plane Shutter (Model A) is fitted, giving time

The Goerz-Anschutz Focal Plane Shutter (Model A) is fitted, giving time and instantaneous exposures, and automatic exposures from \(\frac{1}{2} \) to 5 seconds. The shutter has no complicated mechanism and in the unlikely event of repairs being needed, could be adjusted by any mechanic or handy-man.

Although primarily intended for use in trying climates, this camera, owing to its simplicity, strength, and efficiency, is largely used by the leading press photographers.

Made in quarter-plate, 5×4 postcard, half-plate and stereoscopic.

PRICE LIST.										
Sizes of Plates	41:	×31-	in.	5	×4-i	n.	$6\frac{1}{2}$	× 43.	in.	
Goerz - Anschutz Tropical										
Camera, complete with										
Goerz"Dagor"Lens F/6.8,	£	s	d.	£	S.	d.	£	8.	d	
3 Double Dark Slides and										
Case	14	17	6	16	19	0	19	14	6	
Do., do., with Goerz" Celor"										
F/4·8, do	15	2	6	16	19	0	19	14	6	
Do., do., with Goerz										
"Syntor" F/6.8, do	12	17	6	14	4	0	16	14	6	
Extra Double Dark Slides,										
each	0	14	0	0	14	0	0	18	6	
Plate Changing Box for 12										
plates	2	5	0	2	5	0	2	15	0	
Roll Holder	1	15	0	1	15	0	2	5	0	
Film Pack Adapter	1	0	0	1	0	0	1	5	0	
COMPLETE LIS	TO	N A	PPL	ICATI	ON					

C. P. Goerz Optical Works, Ltd., I to 6 Holborn Circus, London, E.C.









GOERZ-ANSCHUTZ

STEREOSCOPIC CAMERA.



For Plates, Film Packs, or Daylight Loading Roll Films

The stereoscopic model of the Goerz-Anschutz Folding Camera retains all the popular features of the latter camera, and has all the adjustments essential to an instrument being used for stereoscopic work.

The separation of the tenses is variable, so that the relief in the picture can be controlled, the division is removable, and the camera is adapted for panoramic or panel work.

Apart from its utility for rapid exposures, a Focal Plane Shutter as fitted to the Goerz-Anschutz Camera has no small advantages for stereoscopic work. The extra efficiency of this type of shutter enables the worker to use his lens at stops small enough to give the required depth of focus, and yet to make instantaneous exposures. Moreover, both lenses receive exactly the same exposure

PRICE LIST.

Size of Plates.	10×15 cm.	$6\frac{3}{4} \times 3\frac{1}{4}$.
Goerz-Anschutz Folding Camera with	$(5\frac{1}{2} \times 2\frac{1}{2})$	
Goerz "Dagor "Lens F/6.8, 3 Slides	\pounds s. d.	£ s. d.
and Case	22 7 0	22 16 0
Extra Double Dark Slides, each	0 14 0	0 16 0
Plate Changing Box for 12 Plates	$2 \ 5 \ 0$	2 8 0
Roll Holder	1 15 0	_
Film Pack Adapter	1 3 0	

Complete Catalogue on Application.

SPECIAL MODEL FOR TROPICS-See preceding page.

C. P. Goerz Optical Works, Ltd., 1 & 6 Holborn Circus, London, E.C.

KODAKSWITHGOERZ LENSES

These convenient roll film cameras can be obtained ready fitted with Goerz Lenses, or the lenses can be fitted to customers own Kodaks in a few days. Quotations for fitting on application from any dealer.

The Goerz Lens will enable the worker to obtain excellent enapshots under practically all weather conditions.

	With Automat Shutter and "Dagor."	With Automat Shutter and "Celor."	With Automat Shutter and "Syntor"
No. 1 Folding Pocket Kodak, fitted with focussing adjustment	£ s. d. 9 3 6 (Simplex)	£ s. d.	£ s. d.
No. 1a Folding Pocket Kodak, fitted with focussing adjustment	9 16 6 (Simplex)	_	7 16 6 (Simplex)
No. 1a Special Folding Pocket Kodak No. 2 Folding Pocket Kodak	9 0 6 8 8 0 (Simplex)	9 11 6	7 0 B 6 6 0 (Simplex)
No. 3 Folding Pocket Kodak No. 3a Folding Pocket Kodak No. 4 Folding Pocket Kodak No. 4a Folding Pocket Kodak, with	9 10 0 11 7 6 11 7 6	10 1 0 12 19 6 12 19 6	7 10 0 8 17 6 8 17 6
7 inch lens No. 4a Folding Pocket Kodak, with	14 12 0	-	11 17 0
8\frac{1}{2} inch lens No. 4a Speed with 7 inch lens No. 4a Speed with 8\frac{1}{2} inch lens No. 4 Screen Focus Kodak Stereo Hawkeye No. 3	18 2 0 17 15 0° 19 13 0° 12 11 0 16 3 0 18 5 0	19 0 0*	18 12 0 15 0 0* 17 8 0* 10 1 0 12 8 0 14 5 0
Stereo Hawkeye No. 4 No. 1 Panoram Kodak (with ordinary shutter) No. 4 Panoram Kodak (with ordinary	8 10 0	_	
shutter)	10 0 0	-	_

The Goerz Lenses can be detached from the different Kodaks (except the Panoram Kodaks) and used, if required, upon other cameras.

The full aperture of the Goerz "Celor" is F/4.8, but when fitted to the Nos. 3a and 4 Folding Pocket Kodaks the largest aperture obtainable is F/5 (except when a Compound Shutter is used, when aperture is F/4.8). To obtain the full aperture with the other shutters on these cameras a shutter is needed too large to be fitted to the camera.

FULL LIST ON APPLICATION.

* Camera being fitted with a Focal Plane Shutter no Lens Shutter is supplied.

C. P. Goerz Optical Works, Ltd., I to 6 Holborn Circus, London, E.C.



POCKET

The Small,
Practical
Camera.
No larger
than the
hand!

The Goerz "Pocket Tenax" is a folding hand camera in which compactness has been especially studied with the result that the size of the instrument has been brought to the Irreducible minimum. Elegant in appearance and beautifully made, portability has been obtained without a sacrifice of efficiency. A smaller camera for the same sizes of plates cannot be made if the advantages of the "Tenax" are to be retained. The camera is fitted with a Goerz Lens, either the "Dagor" or "Syntor" series, and in the quarter-plate size the "Celor" F/4.8 can also be fitted; and is provided with a special compound shutter giving exposures from 1 second to 1/250th of a second as well as time and bulb exposures. The double extension is sufficient to enable objects within a few feet of the camera to be focussed with the single lens. A diagonal rack and pinion is provided for focussing, and the finder closes up in the camera. Fitting for tripod both ways. All these advantages are obtained in a camera no more than 1½-in, in thickness in 5×4 size.

AUTOMATICALLY FOCUSSED FOR INFINITY.

One press of a push button and the "Tenax" is ready for use.

Prices of "Pocket Tenax"	Cameras and	Accessor	ies.
			Postcard,
		,	$5\frac{1}{2} \times 3\frac{1}{2}$ and
	41×31	5×4	10×15 cm.
Camera with Compound Shutter	£. s. d.	f, s d.	£ s. d.
fitted with Goerz "Syntor"	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	£ s d. 9 0 0	9 10 0
Camera with Compound Shutter			
fitted with Goerz "Dagor"	10 0 0	11 0 0	12 0 0
Camera with Compound Shutter			
fitted with Goerz "Celor"	10 10 0		
Film Pack Adapter	0 8 0 0 2 3	0 10 0	0 10 0
Single Slides	0 2 3	0 8 6	0 4 6
Leather Case, holding camera and			
film pack adapter, or camera and			
three or six slides	0 7 6	0 7 6	0 10 0

C. P. Goerz Optical Works, Ltd., I to 6 Holborn Circus, London, E.C.





PRICE.

Goerz Automatic Vest Pocket Tenax Enlarger for pictures up to 7×5 -in., with one slide

VEST POCKET TENAX BOOKLET ON APPLICATION.

C. P. Goerz Optical Works, Ltd., I to 6 Holborn Circus, London, E.C.









4 10 0

THE AUTOTYPE CO.,

LONDON, - - ENGLAND.

Works: West Ealing, London, W. Offices: 74, New Oxford Street, London, W.C.

MANUFACTURERS OF

Permanent Autotype Tissues

For the Carbon Process, in Upwards of Thirty Distinct Colours.

Transfer Papers and Supports

In Great Variety.

All Materials and Apparatus for the Carbon Process.

Awarded 31 Prize Medals and Diplomas for Excellence of Productions.

GOLD MEDAL DRESDEN 1909.

ABRIDGED PRICE LIST ON FOLLOWING PAGES.

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THE AUTOTYPE COMPANY, LONDON.

ABRIDGED PRICE LIST.

Autotype Carbon Tissues.

Per Band.

4-Band.

A-Band.

No.			rei Dand.		n-Danu.		and.
-	T		12 ft. × 30 in	1. I	2 ft. × 15 in.	oit. >	15 in.
93	Terra Cotta		 6/6		3/6		2/0
94	Ivory Black		 . 6/6		3/6		2/0
95	Chocolate Red		 . 66	***	3/6		2/0
96	Chocolate Brown		 . 6/6		3/6		2/0
97	Warm Sepia		6/6		3/6		2/0
100	Standard Brown		. 6/6		3/6		2/0
101	Standard Purple		0.0		3/6		2/0
102	0 11 01		0.0	• •			
103	117 731 1		 . 6/6	* *	3/6		2/0
			 . 6/6		3/6		2/0
104	Engraving Black		 . 6/6		3 6		20
105	Sepia		 . 6/6		3/6		2/0
106	Red Chalk		 . 6/6		3/6		2/0
111	Cool Sepia		 . 6/6		3/6		2/0
113	Portrait Brown		. 7/0		3/9		20
114	Portrait Purple		7/0		3/9		2/0
142	Turner Sep a		0.0		3/6		20
143	Green Sepia		010		3/6		2/0
145							
	Grey Green		 . 6/6	* *	3/6		20
149	Dark Red		 . 6/6		3/6		2/0
150	Ruby Brown		 . 66		3/6		20
151	Sea Green		 . 6/6		3/6		2/0
152	Dark Blue		 . 6/6		3/6		2/0
154	Carmine		 . 8/0		4/3		2/3
155	Brick Red		. 8/0		4/3		2/3
156	Turquoise		. 8/0		4/3		2/3
157	Bright Red		010		4/3		2/3
158	Bright Green	• •	0.0		4/3		2/3
159	m 1 1 . m.						
160	Bright Blue		 8/0		4/3		2/3
	Platinum Black		 . 6/6		3/6		2/0
161	Violet Mauve		 . 8/0		4/3		2/3
162	Brown Black .		 . 66		3/6		2/0
164	Lilac		 8/0		4/3		2/3
165	Italian Green		 6/6		3/6		2/0
166	Rembrandt Sepia		 6/6		3/6		2/0
168	Ink Pot		. 66		3/6		2/0
169	37 J. L D		. 66		3/6		2/0
504	Cool Brown Mezzo		010	• •	3.6		2/0
001	Coo. Diowii Mezzo	11116	 . 6/6		3/0		2/0
			Per Band.		1-Band.	1-B	and.
			roft. × 30 is	0. 1	oft. × 15in.		< 15 in.
107	Transparency		 . 8/6		4/6		2/6
	,		0,0		-10		-,-

Photogravure Tissues.

Red Chalk.
 Special Brown.
 Burnt Sienna.
 Price per Band, 12 ft. long, 30 in. wide, 15/0.
 Half-Bands, 8/0. Quarter Bands, 4/6.

THE AUTOTYPE COMPANY, LONDON.

Autotype Single Transfer Papers.

	III Dallus	12	R. IOHE	, 30 111	Ches v	ricie.		
No.								Per Band
*73	Toned Extra Matt	٠.					 4.	3/6
*74	Light Toned						 	3/6
	Smooth Toned "Reynolds"	٠.					 	3/0
79	Fine Thin, for small work						 	3/6
108	Medium Smooth White						 	2/9
109	Toned Crayon						 	3/9
110	White "						 	3/9
116	Thick Smooth White						 	3/0
202	Rough Matt						 	3/9
300	White Extra Matt						 	39
764	Etching, Toned						 	3/9

Final Support for Double Transfer.

	in Bands	12 11	. long,	30 ln	cnes w	nae.			
No.			0.	-					Per Band
*75	Light Toned								3/6
76	Matt White Crayon								3/9
	" Toned "								3/9
86	Medium Thickness, White								3/0
	Fine Thin, White								3/6
90	Smooth Toned "Reynolds	"							3/0
1160	Thick Smooth White								3/6
2020	Thick Rough White								3/9
	*The Bands of thes	e tra	nsfer t	papers	are 3	6 inch	es wid	e,	

Temporary Support for Double Transfer.

No Matt, to give Matt Surface when used with Smooth Final Support, size limit 23 × 18 inches.

112 Smooth Stout Substance, size limit 48 × 36 inches
174 Thin Semi-Transparent, for use in the Trichrome Process, etc., size limit 23 × 18 inches.

Prices for all kinds-Supplied in cut pieces only. 7½×5¾ 9½×7½ 1/0 18 23×18 in. Sizes . 5×4 11×9 13×11 16×13 20×17 Per doz. 7d. 3/3

Sample Packets of Tissues and Transfer Papers.

The Autotype Company supply sample packets in three sizes, containing as follows, Insensitive Tissues in 12 varieties, viz:-113 Portrait Brown. 151 Sea Green.

100 Standard Brown. 104 Engraving Black. 105 Sepia. 103 Red Chark. 162 Brown Black. 97 Warm Sepia. 93 Terra Cotta. 152 Dark Blue. 165 Italian Green. 107 Special Transparency. 3 pieces Smooth Single Transfer Paper 108 3 Matt 110 2.2 3 Etching 764 3 Final Support 86 22 **Temporary Support** 112 Prices, post free. Whole-plate.

1-plate.

2/0

3/0 AUTOTYPE COMPANY, LONDON.

12 X IO.

5/0

THE AUTOTYPE COMPANY, LONDON.

Autotype	Tissue	C	olou	ır	Cha	arts	
howing 16 Varieties	of Tissues						

Autotype Sensitive Tissue Storage Boxes.

Tissue stored in these boxes remains in good condition for three months and upwards.

Half-plate and under. 5/0

Whole-plate.

12 × 10 8/6

10/6

Trial Sets of Autotype Carbon Printing Materials.

The essential materials and apparatus for a trial of the process.

Prices, post free in Great Britain and Ireland:—

Whole-plate. Half-plate or 5 × 4.

Quarter-plate.

Each Set contains: Sensitive tissue, single transfer paper, actinometer, squeegee, safe edge masks, powdered alum, and instructions for use.

Autotype Spirit Sensitiser.

Enables tissue to be sensitised and dried ready for printing within 15 minutes of commencement of operations. No special plant or apparatus needed. Invaluable for use in the Tropics, preventing the dissolving of the Tissue Coating during sensitising and drying.

Price 1/0 per bottle.

Post free, Inland, 1/3.

Autotype Border Negatives.

Twenty-four different designs. Whole-plates 5/0 each, half-plates 3/6 each. Illustrated List free.

Autotype Texture Films.

Give canvas grain and other texture effects on smooth surface papers. They are invaluable for artistic work.

List and particulars.

Send for Illustrated List and particulars.

Autotype Permanent Spotting Colours.

The actual Pigments employed in the manufacture of Autotype Tissues, prepared as moist water colours. By the use of these Colours in spotting and finishing Autotype Prints, the tones of the copies can be accurately matched.

In Porcelain Pans, price 1/0 each.

THE AUTOTYPE COMPANY, 74, NEW OXFORD STREET, LONDON; and WEST EALING, MIDDLESEX.

HOOD PRODUCTIONS:

Portfolio of Specimens FREE.

In asking for prices, state number and size.

1-TONE
(3 Grades)

Line 3-Colour 4-Colour BLOCKS

POST CARDS!

3-COLOUR (from natural objects, oils, or water-colours). See p. 331,

Monochrome (grey or brown)
"POYNTER" PROCESS.

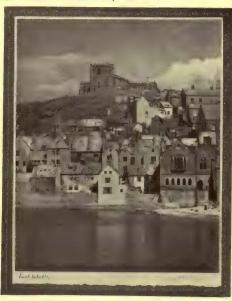
CHEAP 4-Colour (splendid colour work from Ordinary P.O.P. prints), See p. 331.
See p. 331.

LETTERPRESS PRINTING:

View Books.
Catalogues.
School and Hotel
Prospectuses.
Periodicals.
Technical Books.
COLOUR
ILLUSTRATIONS
from
AUTOCHROMES

Photographers'

Booklets and Lists. Invoices. Note Headings.



EAST WHITBY.

By Harold Hood.

HOOD'S cater efficiently for Foreign Orders, and their long experience with foreign indents enables them to quote definite prices delivered f.o.b. your nearest port. Small orders are sent per parcel or printed-papers post.

All foreign orders MUST BE PREPAID direct, or through London agents on B/L.

Valuable time is often wasted by inattention to this necessary rule.

HOOD & Co. Ltd.

Telegrams and Cables:
"Sanbride, Middlesbrough."
A.B.C. Code, 5th Edition.

Photo-Engravers, Designers,

ST. BRIDE WORKS,

Middlesbrough, England



Miss MADGE THORPE

Ellis & Walery, Photo.

HOOD

HALF-TONE

Blocks

In 3 Qualities:

The Standard A-quality on which we always quote and supply, unless ordered otherwise. These are deep and brilliant, and HOOD'S reputation is built on this quality.

Mr. ALAN REID of Edinburgh says: "I am greatly pleased with the set of LINE BLOCKS and HALF-TONES for my book, and will specially note your good work in preface."

OUR CHEAPEST BLOCKS are now called

"AutoBlocks"

(the term "B-grade" being now withdrawn). As the name shows, these blocks receive no hand retouching, the whole process being mechanical and automatic. The cheapest **good** blocks in the world!

The D. L. PROCESS (Half-tones De Luxe)

represents the best we are able to produce. D.L. blocks are strongly recommended where a little extra price is of no moment compared with the obtaining of highest quality results.

Hood ONE-DAY Post Cards.
A well-known Fellow of the Royal
Photographic Society writes: "The printing
is beautiful, and the speed is marvellous."

PRICES and few fine SPECIMENS of Line, Half-tone, and Colour Blocks, free on application; or including 36 post cards (all styles) 6d. U.K. (Alabroad for 2/6 to 5/-, delivered.

We have recently opened a
NEW DAYLIGHT
STUDIO

for dealing with the satisfactory reproduction as colour or half-tone blocks of commercial articles of every portable description, such as Fabrics. Tinned and Boxed goods, Foods, Furniture, small Machinery, Toys, Paintings, Objets d'Art, &c.

We are sometimes able to get results which the ordinary portraitist has not the opportunity nor experience to equal.

HOOD & Co. Ltd. ST. BRIDE Middlesbrough

HOOD Post Cards!

have steadily grown in favour since 1908, in all styles. We believe the reason is that we really do take care with each subject.

POST CARDS IN MONOCHROME criticised and initialled by a skilled inspector, and this applies with equal force to LARGE and SMALL ORDERS.

No printing is allowed to proceed until

(grey, brown, or green,) ON FINEST "CHROMO" CARDS.



MISS EVELYN HOPE.

By Elwin Neame.

THE prices below are for Cards only. The necessary BLOCKS, in "A" quality cost 7/1 each $(5\pm x3\pm)$, or 5/- (4x3), singly; 4 to 7 subjects at 6/11 or 4/10 respectively; 8 to 15 at 6/9 or 4/8; larger Nos. at 6/6 or 4/6. For full-card (58x38) blocks add 1/3 to each of the above titles, and 6d. per doz. for titling letters. The same blocks will of course do for reprints.

Monochrome Cards.

All-white margin. Normal despatch. Any monochrome colour. Small lots 5 days; large lots require longer time.

Blocks extra as above. Boxed 250's at 3d, 1000 extra unless countermanded.

1000 cards each of 100 subjects	 £38/10/0	2000 each of 1 subject	 	 £1/0/0
1000 cards each of 32 subjects	 13/12/0	1000 each of 1 subject	 	 10/6
1000 cards each of 12 subjects	 5/12/6	500 each of 1 subject	 	 8/0
1000 cards each of 6 subjects		250 each of 1 subject	 	 6/0
1000 each of 2 subjects	 1/1/0	100 each of 1 subject	 	 4/6

If flush-to-margin at any side, or full-card style (much the best), add 1/6 per 1000 to the above brices

ONE = DAY POST CARDS

The COLOUR of ONE-DAY CARDS MUST BE LEFT TO OUR DISCRETION

Flush-Margin 1000, 14/3 boxed Block (58x38) 9/4, total 23/7.

There is not time to hand-letter lengthy titles; the foot of "flush" block can be cut away 4 inch, and the title printed from type, in which case deduct 1/-.

White-Margin one-day cards, 1000, 12/9; 54x34 block, 7/1; total 19/10, short title free.

"The P doubt the printing I

Mr. KENNETH F. BISHOP, Warrington, writes:
"The POSTCARDS to hand are without doubt the finest example of process block printing I have seen. One man, indeed, who

took some to sell, wanted to sell them at 2d. instead of Id."

Ø

Messrs, R. FENNESSY & SON, write: "We have just received the 7 HORTICULTURAL BLOCKS, with which we are very pleased, and we are much obliged for your dispatching them so promptly."

Illustrated Guide Book.

The South China Morning Post says:

'The Handbook was produced by Messrs. HOOD & Co. Ltd., and is another beautiful example of the work of these well-known Artistic Printers and Publishers. The splendid half-tone work compares most favourably with any similar publication.'

a

A "Little Hood" Block

Mr. G. ECKFORD, of Nonagh, says: "Your 'Poynter' Full-tone is altogether delightful."

14 = Day Post Cards.

The COLOUR of 14-DAY POST CARDS must be left to our discretion

Flush-to-Margin 1000. 10/3; block, 5\(\frac{5}{8}\times 3\frac{1}{8}\), 8/4; title, 1/-; total. 19/7. Repeats 10/3. White-Margin, 1000. 8/9; block, 5\(\frac{1}{8}\times 3\frac{1}{8}\), 7/1; total, 15/10. Repeats, 8/9.

POST CARDS by the POYNTER PROCESS

COST 50 per cent. more than the rates for normal-despatch cards, but with a minimum extra of 10/- per subject. The blocks cost just the same as for ordinary monochrome. For example, 1000 "Poynter" Cards, with flush-

to-margin block, titled, would cost a total of 31/7 boxed, but 2000 would only cost 22/2 per 1000. White margin "Poynter" Post Cards would be respectively 27/10 or 18/9.

We now supply GLOSSED POST CARDS

THE RESULTS ARE PRACTICALLY IDENTICAL WITH SILVER PRINTS.

Extra Price (on 5-Day Cards) from 15/6 downwards per 1000, depending on quantity.

HOOD & Co. Ltd. ST. BRIDE Middlesbrough

4 = Colour Post Cards.

THOSE who only know the HOOD 4-COLOUR CARDS of 3 or 4 years since, should send for specimens by our latest process. We have discarded the now common stipple process. In its place we offer a new method which, for smoothness and beauty of colouring, it would be hard to match at anything like the price.

4-Colour Post Cards (including blocks, 5\pm x3\pm , which we now present gratis).

Boxing 3d per 1000. For flush-to-margin subjects, add 1/6 per 1000, any quantity.



Some Recent HOOD BOOKLETS.

TRICHROMATIC (3-Col.) Post Cards

FROM Autochromes. Natural Objects. Paintings. This is the best of all colour processes. giving results perfectly wonderfully true to the original objects. Because first cost of the of the necessary plates, it is always

wise to order not less than 2000 or 5000 of each subject, so that they can be sold profitably.

BLOCKS: \$2 18s 6d for single sets; 12 sets at \$2 15s (any size up to 5\hat{8} x 3\hat{8}.

Ask for prices for LARGER 3-COLOUR BLOCKS for CATALOGUES, &c. 12 subjects, 5000 cards each, at 15/6 per 1000 5000 cards of 1 subject, at 18/6 per 1000 12 1000 at 20/6 per 1000 2000 of 1 at 23/- per 1000 2.0 9.0 9.9 at 28/6 per 1000 12 2000 at 16/6 per 1000 1000 of 1 at 18/- per 1000 500 of 1

1/6 per 1000 extra if desired as full-card subjects.

Note Headings. We know Photographers' Stationery requirements, and we know that many a photographer, doing quite

decent work, doesn't realise what he loses by THAT WRETCHED LETTER HEADING! For a very low price we can give something in good taste; while if you will let us do you one of our now famous Half-tone Designs, you can thus show miniature specimens of your work with each letter you write. Let us quote for your next lot of Note-Headingsplain, Line, Half-tone (including your specimens), or stamped from steel dies.



HALF-TONE DESIGNS FOR ANY BUSINESS CARD OR NOTE-HEADING (reduced).



NEAME SERIES of Artistic Portraits

WE have made arrangements for the supply of

Blocks and Electros (in half-tone or colour from the great range of charming portrait studies which have deservedly brought Mr. Elwin Neame world-wide distinction. Delightful BLOCKS of these subjects suitable for Calendars,

Magazines, Supplements, Post Cards, &c., at short notice. Write HOOD'S Large specimens will be sent for 7/6, credited on safe return. for terms.

The Rev. M.B. THURBURN, of Reigate, says: Autochrome Colour Blocks. "Let me say how splendidly the Baptism Certificates have been done and also how much pleasure they have given the recipients. Dr. Freshfield was very much charmed with the design and I think that the certificate is not in the same class with any others I have seen and altogether makes a most gratifying memorial."

HOOD & Co. Ltd. ST. BRIDE MIDDLESBROUGH

PHOTOGRAPHERS' ADVERTISING

Expensive booklets are not "the only way" for middle-class studios.

Three simple styles of booklets at intervals throughout the year are better business bringers than one solitary and

costly "splash.". Advertising is, to most photographers, as necessary an expense as Rent, and HOOD BOOKLETS, CIRCULARS, and Advertising POST CARDS should do relatively as well for you as our own advertising does for us. Photographers should ALWAYS illustrate their advertisements by reproductions of their own work.

ALWAYS illustrate their advertisements by reproductions of their own work.

Hood's will gladly help your "AD-WRITING" by criticism or even re-writing from your own rough draft—FREE OF CHARGE to all customers. Three quarters of present-day advertisements are wasted through lack of incisive and effective phrasing—and

unattractive printing.

COLOUR! Are YOU sharing in its benefits?

NEW BRANCH: PHOTOGRAPHIC APPARATUS and MATERIAL



Airbrush retouching of Machines, Furniture, &c.

School Prospectuses. Dr. J. W. MARSHALL, M.Sc., Yealand Convers, writes: I am pleased to state that the prospectuses have given great satisfaction. The way in which the process blocks have been made, and the finished pictures produced therefrom, reflect the greatest possible credit upon you. Everyone who has seen the prospectus describes it as a work of art. As an instance of its success I may say it was selected as the best in a case where a gentleman had about 70 to choose from."

HOOD & Co I ad ST. BRIDE M: 111 1

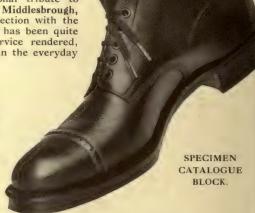
HOOD PRINTING & ENGRAVING Recent TESTIMONIALS

"POYNTER" Post Cards.

Kirkcudbrightshire Advertiser says: "Never before has anything quite so good come out of Kircudbright as the new series of Picture Post Cards [HOOD POYNTER] just issued by Mr. Robert McConchie of that town."

CAPT. OWEN WHEELER, of The "Telephoto Quarterly" says: "Lastly, I should like to include in this brief appreciative retrospect a personal tribute to Messrs. HOOD & Co. of Middlesbrough, whose assistance in connection with the Block-Making for "T.Q." has been quite outside the ordinary service rendered, even by first-class firms, in the everyday course of business."

The EDITOR of the "HOUSE" Journal of a great Cocoa Firm writes: "We are very greatly pleased with your work, and I think it is due to you to say that a friend of mine, who has had much experience in connection with the printing trade, congratulated me upon our excellent inset."

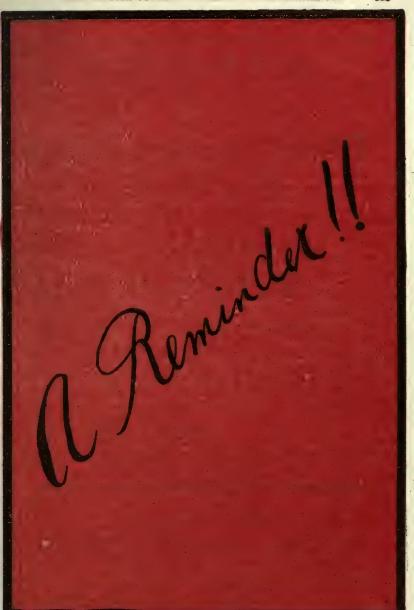


Blocks for Lists; &c. from ANYTHING that can be photographed.

REPRODUCTIONS OF AUTOCHROMES.

The British Journal of Photography says: "Messrs. HOOD & Co. Ltd., send some three-colour proofs from Autochrome plates by a modified method, worked out by Mr. HAROLD HOOD, F.R.P.S. The proofs are remarkably free from the "graininess" frequently noticeable in three-colour photo-engravings from Autochrome originals. Not every reproduction firm has been able to do justice to the colours and gradation of the Autochrome, but the examples sent us have been accompanied by the original colour transparencies, and this allows us to say that in the preservation of the quality of the original, Messrs. HOOD are evidently to be trusted."

HOOD & Co. I to ST. BRIDE MIDDLES RROLICH



LET US TELL YOU THAT

OUR BUSINESS

IS THE MANUFACTURE OF

PHOTOGRAPHIC PAPERS

BROMIDE (In all Grades).
GASLIGHT (Zigas).
SELF-TONING (Zigo).
CARBON TISSUE (T.I.C. Brand).
CARBON TRANSFER PAPERS.

And we insert this little list as a REMINDER!!!

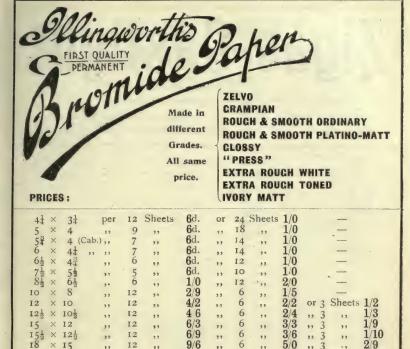
If you are interested please write for full catalogue

Thomas Illingworth & Co., Ltd.,

WILLESDEN JUNCTION, LONDON, N.W.

Telephone: Harlesden 1009.

Telegrams: Squeegee, London.



IN BOXES containing 1 Cross Sheets.

,,

6

12/6

18/0

5章	×	4	 10/0	81/2	×	61/2	 22/6

SPECIAL NOTE OF ZELVO

12

23 × 17

25 × 21

It has the appearance of a Wet print When Dry.

If you are interested please write for full catalogue

Zigas-Gaslight

IN TWO GRADES-

- "ORDINARY" (HARD) for Weak Negatives.
- "PORTRAIT" (SOFT) for Strong or Studio Negatives. Matt, Glossy, and Satin Surfaces supplied in each grade.

CARDETTES.

PRICES.

SIZE OF PAPER.	_			<u> </u>				Post-car (Un)	d Thick printed)	
25× 13		ces for	6d.							
216 × 14 25 × 25	00		6d.				_	_		
35 × 25			6d.	42	pieces	for :	1/0	_		_
31× 31	-6	7 12	6d.	34	1)		1/0	_		_
38 × 38		19 29	6d.	30	11		1/0	Marijana.		-
44× 12	-0	79 79	6d.	30	77	11				
41× 21	-6	77 77	6d.	34	11	,,	1/0	_		-
42× 31	**	77 77	6d.	26	11		1/0	20 piec	es for	1/0
5 × 4	**	77 79	6d.	21	11		1/0	14 ,,	11	1.0
58× 38		77 77	6d.	21	17		1/0	14 ,,	12	1/0
64× 31	0	77 77	6d.	17	11		1/0	12 ,,	17	1.0
$6 \times 4\frac{1}{4}$	Q	77 77	6d.	17	*1		1/0	12 ,,	77	1/0
6½× 4½	**	79 79	1/0	12	22		1/0	9 ,,	22	1/0
71× 5	***	77 77	1/0	10	27		1/0	8 ,,	22	1/0
81× 61	6	99 29	1/0	12	77		2/0	5 ,,	11	1/0
13 × 4	6	19 19	1/0	12	77		2/0	5 ,,	17	1/0
10 × 8	6	77 77	1/5	12	,,		2/9	3 11	77	1/0
12 × 10	6	77 77	2/2	12	33		4/2	3 11	22	1/3
125×105	6	19 99	2/4	12	**		4/6	3 ,,	11	1.6
15 × 12	6	99 99	3/3	12	22		6/3	3 11	22	20
153×123	6	11 11	3/6	12	11		6/9	3 11	11	2,6
18 × 15	6	17 17	5/0	12	11		9/6		"	
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D.C	DLLS.						200= 0	1000		
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25 fe	et rolls		6	'Standa	rd'' si	ze .	5½×3½	***	8 for	6d.
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00	•••	17		'Court'	' size		4\frac{1}{4} \times 3\frac{1}{4}	***	10 ,,	6d.
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40 ,, ,,		35	/0	91	11		** 99	I	,,	45/0
11					•					

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ZIGO

SELF-TONING.

MATT or GLOSSY SURFACE.

Size of Paper.	Number of	F PIECES.	
OLD OF THEK.	6d. PACKET.	1/0 PACKET.	
25 X I 3	36		
$2\frac{1}{2} \times 2\frac{1}{2}$	28	-	
$3\frac{1}{2} \times 2\frac{1}{2}$	20	42	These Prices
$3\frac{1}{4} \times 3\frac{1}{4}$	16	34	
$3\frac{1}{2} \times 3\frac{1}{2}$	14	30	also apply
4½ × 1½	28	Marandori .	area appro
$4\frac{1}{4} \times 2\frac{1}{2}$	16	34	to our
4½ × 3½	12	25	20 041
$4\frac{1}{2} \times 2\frac{3}{4}$	12	25	"Blue Label"
5_ × 4	10	21	Dide Labei
$ \begin{array}{ccccccccccccccccccccccccccccccccccc$	10	21	F100
$6\frac{3}{4} \times 3\frac{1}{4}$	8	17	ZIGO.
6 × 4±	8	17	
$6\frac{1}{2} \times 4\frac{3}{4}$		12	
$7\frac{1}{2} \times 5$		10	
$8\frac{1}{2} \times 6\frac{1}{2}$		7	
10 × 8		4	
12 × 10		3	

BOXES containing 1 gross Sheets.

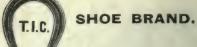
38	X	23	C.D.V.	No.	I	3/0	1	$5\frac{1}{2}$	X	4	Cabinet	No. 2	7/6
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44	×	34	1-plate			5/6		$6\frac{1}{2}$	×	43	½-plate		11/3
$5\frac{3}{4}$	X	4	Cabine	t No.	I	8/0	,	$8\frac{1}{2}$	×	$6\frac{1}{2}$	1-plate		19/6

ZIGO "Blue Label" Self-Toning.

A Paper of exquisite Satin Surface. Gives a beautiful range of tones by simply exposing to daylight and fixing in Hypo (4 tablespoons to a Pint of Water).

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CARBON TISSUES

The following are a few of the most popular tints:-

- 50 Standard Brown
- 51 Portrait Brown
- 53 Willesden Brown 55 Standard Purple
- 56 Portrait Purple
- 58 Engraving Black 59 Platinum Black
- 60 Warm Black 63 Grev Black
- 64 Transparency
- 65 Sea Green
- 66 Willesden Sea Green
- 67 Milan Green
- 68 Dark Blue

- 70 Red Chalk
- 71 Willesden Red
- 75 Sepia Ordinary
- 76 Willesden Sepia 77 Warm Sepia
- 78 Cool Sepia
- 80 Golden Sepia
- 81 Gravure Plat Sepia
- 82 Violet
- 83 Terra Cotta
- 84 Lilac 85 Carmine
- 86 Light Blue

- 87 Italian Green
 - 88 Nut Brown 89 Brown Black
 - 90 Greenish Sepia
 - 91 Gravure Special X Sepia Red Chalk 92
 - 93 Platinum Black
- 98 Crimson Red
- 96 Bright Green
- 97 Blue Black
- 98 Special XA 99 Bright Red

INSENSITIVE:	In any Colour (including "Gravure").	Transparency Tissue.	Photogravure Tissue in Three Colours
Per band 12 ft. long, 30 in. wide "" \$\frac{4}{2}\$ ", 9 ", 30 ", "" \$\frac{1}{2}\$ ", 6 ", 30 ", "" \$\frac{1}{4}\$ ", 3 ", 30 ", "" \$\frac{1}{4}\$ ", 3 ", 36 ",	 6/6 5/0 3/6 2/0 7/6	8/6 6/6 4/6 2/6	12.6 9/6 6/6 4/0
SENSITIVE:			
Per band 12 ft. long, 30 in. wide "	 7/6 6/0 4/0 2/6	9/6 7/6 5 0 3/0	15/0 11/6 8/0 4/6

Transfer Papers. we have the largest variety in the trade.

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Single Transfer Papers.



Illingworth's Carbon Process is one which produces permanent prints with artistic quality, and great range is given by the different qualities of Transfer Papers which can be used.

No.				
104-Medium Thickness for ordinary work, per band, 12 ft. × 30 in.				2/9
105—Thick for large work, per band, 12 ft. × 30 in	***			3/0
109-Willesden Crayon, white matt grain, per band, 12 ft. × 30 in.				3/6
110—Fine White Rives for small work, per band, 12 ft. × 25 in				4/0
112-Toned Matt for small work, per band, 12 ft × 30 in				3/6
115-Fine White for small work, per band, 12 ft. × 30 in				3/0
108-Toned Etching, per band, 12 ft. × 30 in		***		3/9
108-Toned Etching, in sheets, 30 in. × 22 in				-/9
III-White Etching, per band, 12 ft. × 30 in				-
III-White Etching, in sheets, 30 in. × 22 in., per sheet				-/9
113- White Whatman, in sheets, 30 × 22 in., per sheet				1/0
114-White Hand-made, in sheets, 30 × 22 in., per sheet				1/0
107—Toned Whatman in sheets, 20 × 22 in., per sheet				1/0
C 700 1 C 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				3/0
70 6 1 1 1 6 6				7:0
	***		***	4/0

131-Silver Paper, for Moonlight Effects, in sheets, 30 × 22 in.	***	***	* * *	1/0
150-"Gravure," White or Toned	***			4/0
127-Mauve Enamel, 12 ft. × 26 in	***			3/6

Double Transfer Final Support.

00-Medium Thickne	ss, per bar	nd, 12 ft. ×	30 in.	***	 		***		3
oi-Fine Thin White					 		***		4
02-Fine White, for s			12 ft. X	30 in.	 				3
03-Toned Matt, per	band, 12 ft.	× .30 in.			 				3
16-White Matt	19	1.2	***		 ***	***			
17-Toned Whatman	,,	4.9			 ***				
18-Toned Smooth	91	2.2			 ***				
19 - White Whatman		22			 	***		1	
20-Transfer de Luxe					 	***			5
25-Thick, for large w			30 in.		 	***			3
51-" Gravure," Wh		d	***		 ***		• • •		4
		***	***	***	 	***	***		4
	(D 1 D				 ***		- +		4
22-Rough Grained,			***		 				4
24-Mauve Enamel,	12 II. × 26 1	in	***		 ***				4

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HAVE YOU HEARD OF THE

RED LINE POSTCARD

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BROMIDE & GASLIGHT

This is the very best Postcard made.

The card itself is of a beautiful color and quality; the Emulsion is made from the finest formula extant, the outcome of years of experience.

Good blacks, pure whites, and great latitude of exposure are its greatest features.

Sold in Packets, 8 for 6d., or 18 for 1/-OR IN LARGE QUANTITIES.

PUBLISHERS and LARGE USERS

Should write for Prices and Samples. We are the Largest Makers of Photographic Postcards in the United Kingdom, and can either quote for Rad Lines or a Cheaper Quality.

THOMAS ILLINGWORTH & Co., Ltd., WILLESDEN JUNCTION, LONDON.

SCHERING'S PURE PHOTOGRAPHIC CHEMICALS

ARE • ESSENTIAL • TO PHOTOGRAPHIC SUCCESS

SCHERING'S Chemicals are now sold in small packages bearing their Trade Mark, which is a guarantee of purity and excellence. More failures in photography are due to the impurity of chemicals employed than to any other cause. Be sure of purity!





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THE DEVELOPER 'PAR EXCELLENCE.'

SCHERING'S PYRO

(PYROGALLOL, PYROGALLIC ACID)

Of

World-Wide Fame
Purity and Excellence



RE-SUBLIMED

LIKE FRESH FALLEN SNOW

CRYSTALS

BEAUTIFUL WHITE CRYSTAL

CHEMISCHE FABRIK AUF ACTIEN
(Vorm. E. Schering).

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SCHERING'S PYRO.

NOTWITHSTANDING the enormous number of newer developers from time to time placed on the market, Schering's Pyro holds its own for simplicity of working and absolute control.

No other agent will give negatives of such fine printing qualities, and, no matter what printing process be employed, the resultant print is always richer and will show more detail and lose less in toning.

It is significant that all leading dry-plate manufacturers recommend Pyro as the standard developer.

Pyro is the simplest of all developers; whether for under or over-exposure it is always adaptable, and with it negatives, soft or hard, with full gradation are obtained at will, with perfect ease and certainty.

ALL PHOTOGRAPHERS SHOULD READ

"PYRO-SODA as a DEVELOPER."

By H. MUDIE DRAPER.

-POST-FREE.-

Schering's Developers

A developer of exceptional power. Renders full gradation, and is easily controlled.

Highly concentrated universal developer. Dilution, 1 in 20-40.

URATOL For soft negatives of fine gradation. Dilution, 1 in 20-40.

HYDROKINONE Of world-wide fame for purity and reliability.

PARAMIDOPHENOL

A powerful developer. In

SATRAPOL

A rapid developer for contrasty

ANTHION The most perfect hypo eliminator.

TONE-FIXING SALTS (contg. Gold.) Dissolved in water yield a combined bath, unrivalled for beauty and brilliancy of tones. In 6d. and 1/- tins.

VARITONE TABLETS' For colour-toning Bromide and Gaslight prints, also lantern slides, to all tones in Red, Brown, Blue and Green, according to mixing.

(NOW IN COURSE OF PREPARATION).

Send a post-card now for a copy to be sent on day of publication. Ready in the Spring.

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WRATTEN PRICE LIST

(ABRIDGED).

NEW ISSUE DURING 1909. THE WRATTEN LANTERN PLATE.

A Plate of NEW TYPE, giving warm tones with great ease.

PRICE LIST OF PLATES.

Size, inches.	Ord., In I.D.S., A Process Lanter	and		peed richr	and ome.	Proces	ed Plas Par hrom	and	2	K-Ra	у.		
$3\frac{1}{2} \times 2\frac{1}{3}$ $3\frac{1}{4} \times 3\frac{1}{4}$	£ s.	d. 0	£	s. 1	d. 3	£	s. 1	d. 6	£	S.	d.		
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Size, Gentimetres.	Size, Larger Sizes up to 24-inch width Prices on request.												
9×12 13×18 18×24 24×30 30×40	1 4 7 12 1 8	90396	1	2 4 8 15 14	09933	1	2 5 9 17 18	4 4 9 0 0	1	5 10 18 16	8000		
Backing at per doz. $\frac{1}{2}$'s, 3d. $5 \times 4 & \frac{1}{2}$'s, 4d. $7\frac{1}{2} \times 5 & \frac{1}{4}$, 6d.													
10×8, §	10×8 , 9d. 12×10 , 1/2 $15^{\circ} \times 12$, 1/6 All other sizes at proportionate prices.												

Wratten & Wainwright, Ltd., Groydon.

RATTEN LIGHT FILTE

WRATTEN FILTERS are made in the most accurate manner, in carefully selected glass, and will be found entirely satisfactory in use. The dye used in the K screens is permanent to light and the colour will not alter.

PRICES OF FILTERS.

Note with regard to the area of gelatine filters. The area of a filter is found by multiplying together the length of the two sides. Thus a piece of film two inches square contains four square inches. Circles are taken as being of the area of the square from which they are cut. A three-inch diameter circle is thus charged as nine square inches.

Our prices for Film are:-K Filters, 4d. per square inch. Minimum

Order, 6d. Postage, 1d.

Tri-colour Filters 6d. per square inch, per set. Minimum Order, 1s. Contrast and M Filters 6d. per square inch. Minimum Order, ls.

CEMENTED K FILTERS.

Circles or Squares Unmounted.	Mounted in Light Metal Cell.	Mounted in Special Screw Cell to Order.
s. d. 4 3 6 5 6 0 6 10 12 6 15 0 0	s. d. 6 36 7 6 6 6 9 0 0 10 13 9 15 19 6	8 d. 8 0 9 0 9 6 10 6 12 0 15 0 17 6 21 6
		Unmounted. Metal Cell.

Intermediate sizes at price of next larger.

WRATTEN TRICOLOUR SCREENS

are the most accurate Tricolour Screens made. Used with the Wratten Panchromatic Plate the most perfect colour rendering is obtained.

CEMENTED TRICOLOUR FILTERS.

	nch	square		15	l. 0 set.	Fo	r Rep	eating	Back	s.
$2\frac{1}{2}$	2.2	2.2	. 50	25	0 ,,				S. (t.
3	3.3	7.7		30	0 ,,	$3\frac{1}{2}\times2\frac{5}{8}$			27	g set.
31	2.3	11		35	0 ,,	1-plate			32	6 ,,
33	,,	,,		40	0 ,,	-plate			85	0 ,,
4				50	Ω	1-plate			£.9	

SPECIAL CONTRAST SCREENS

for all purposes. PRICES on receipt of requirements.

WRATTEN SCREENS IN FLATS.

For the most accurate definition, and wherever screens are to be used with telephoto or other long-focus lenses, it is necessary to use filters emented in glass which has been surfaced with the same accuracy as lenses. Such filters are prepared as filters cemented in flats.

K FILTERS CEMENTED IN FLATS.

					1	JOMNU	INT.	ED.					
3	inch	circular	or	square			31	inch	circular	or	square		62/-
2	2 "	91	11	11	* *	35/-	4	99	99	9.9	19		75/-
2	¥ ,,	99	22	33		40/-	45	9.9	11	3.9	29	• •	90/-
2	1 "	21	11	99		50/-	3	19	11	9.9	11		120/-

TRICOLOUR SETS, or K I., K II., and K III. CEMENTED IN FLATS.

3 inch	square,	per set	 £7	5	0	1	4 i	nch	square,	per set		£11	0	0
D\$ 11	2.9	2.2	 £8	0	0		45	22	11	29	• •	£15	U	0
J2 11	2.5	33	 £9	0	0	1	5	91	99	21		£17	U	U

WRATTEN SAFELIGHTS

ARE MADE IN THE FOLLOWING VARIETIES :-

SERIES OO .- For Lantern Plates.

SERIES O.—For Bromide Paper. SERIES I.—For Slow and Medium Plates.

SERIES II.-For Ultra-Rapid and Orthochromatic Plates.

SERIES III .- For Red Sensitive Plates, especially the Wratten

Panchromatic and Verichrome Plates.

SERIES IV.—A green Safelight for ordinary plates. By far the most comfortable light for working ordinary Plates.

PRICE LIST.

Any Series,	Safelights,	8½ × 6½	s. d.	Any Series,	Safelights,	12	×	10	 S. 5	
22						15	99	12	 7	6
	Inter	mediate si	zes at th	re price of ne	xt larger.					

SPECIAL SAFELIGHT LAMPS.

One of these lamps with a green safelight makes the development of Panchromatic Plates as simple as that of any other plates. They are made

OL			S.	d.
Electric Light, with 10 × 8 Green Safelight			10	6
Incandescent Gas ", ", "			10	6
Oil, with burner and chimney ,, ,,			10	0
Extra Safelights for Bromide Paper, Ordinary Slow	Plate	8.		
Extra Ranid and Orthochromatic Plates	00		A	0

Wratten & Wainwright, Ltd., Croydon.

WRATTEN BOOKLETS.

The Wratten Booklets have been written to assist our customers. Some are of general interest, some for specialists. They will be found to be fresh and clear in their handling of the subject with which they deal, and are neither purely advertising matter nor composed of stale extracts from text-books or Journals.

We send the following post free on application:-

- DESCRIPTIVE LIST of 38 pp., containing a mass of information relating to plates and screens.
- REAL ORTHOCHROMATISM, dealing with the use of Panchromatic Plates, including the reasons for their use and instructions for their development.
- MORE ORTHOCHROMATISM is a more advanced pamphlet on the same subject, dealing with difficult points in both theory and practice.
- SCREEN NEGATIVE MAKING. This is only of interest to "Process" Workers. It deals with the application of dry plates to direct tricolour block making.
- INKS FOR TRICOLOUR PRINTING is another booklet for the Process
 Worker, dealing with the selective methods to be applied to Tricolour
 Inks.
- LANTERN SLIDES, giving particulars of the Wratten Lantern Plates, with explicit directions for the preparation of warm-toned slides from them.
- THE SELECTION OF PLATES AND FILTERS FOR PHOTOMICRO-GRAPHY is now out of print, and will be replaced by a new booklet.
- STAND DEVELOPMENT gives a method of calculating the time of development when using this method.

On receipt of 1d. stamp to cover postage we will send a card containing samples of our K Orthochromatic and Tricolour Filters.

WRATTEN BOOKS.

- THE PHOTOGRAPHY OF COLOURED OBJECTS, by C. E. Kenneth Mees, D.Sc. 1s. nett, 1s. 3d. post free. 76 pp. demy 8vo, with Photogravure Frontispiece and 14 full-page half-tone illustrations, besides a large number of original diagrams. This book is a necessity to every photographer who wishes to understand his work.
- AN ATLAS OF ABSORPTION SPECTRA, containing the photographed spectra of about 200 dye-stuffs and 76 filters, 6s. nett.
- WRATTEN LIGHT FILTERS, containing particulars of 77 varieties of filters, with their spectra, 6d. nett.

Wratten & Wainwright, Ltd., Croydon.

Telegraphic Address: WRATTEN, CROYDON.

Telephone No.: 572 NAT. CROYDON.

The Busch "Reflex" Camera

THE BUSCH "REFLEX CAMERA" is the result of long experience and careful study of the merits and demerits of nearly all existing cameras of the type, and has been constructed with due regard to its adaptability to all classes of Busch Lenses.



The material and workmanship are of the best, and whether one regards the sprcial double top and bottom rack for focussing, which secures perfect parallelism between the screen and lens board even for heavy lenses, or the fine optically worked surface silvered mirror, the expert as well as the novice will feel assured that "efficiency" has been the watchword of the makers and that nothing has been left undone to secure a thoroughly reliable instrament.

Vibration during or following the release of the mirror and shutter has been entirely eliminated by a very ingenious arrangement of the mirror mechanism and the shutter is almost silent in action—a feature that will be appreciated by all operators, particularly naturalists who are engaged in photographing birds, animals, &c.

The movements for setting, releasing, and adjusting the slit aperture are all outside.

Time and instantaneous exposures can be made up to 1,000th part of a second.

The mechanism is such as will secure both uniformity in speeds and reliabil ty in working.

A scale is provided showing the slit openings and the resultant speeds.

The front is fitted with an adjustable panel, and the back revolves, so giving a reversible movement for horizontal and vertical pictures.

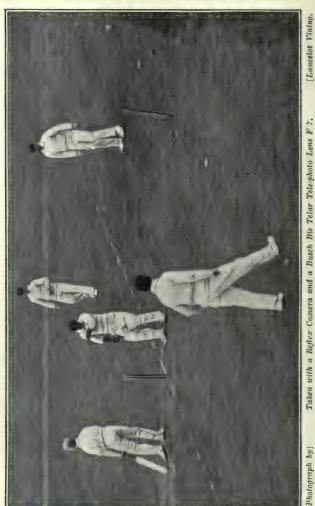
The top and bottom rack movement is of considerable importance, and a very valuable feature, when the camera is used in conjunction with high-class flat field anastigmats, or bulky lenses of long focus requiring an extended front.

The mechanism secures a rigid front, on which a heavy lens will have no influence, and the plane of the plate and lens will consequently always be parallel.

Prices complete with Busch Lens and Three Plate Holders.

						34	x 2	1	41:	x 3	1
A.	with	Detective A	Aplanat		 F 6	£12	0	0	£13	10	0
B.	**	" Leukar "	Anastigmat	No. 2	 F 6.8	14	5	0	16	8	
C.		" Omnar "	"	No. 2	 F 5.5	14	5	0	16	8	0
D.				No. 2	 F 4.5	16	0	0	17	8	0
E.	99	"Bis" Telar	"	No. 2	 F9	12	6	0	13	14	0
F.	22			No. 1b	 F 7	13	10	0	15	18	0
G	,,	***	**	No. 2b	 F 7	14	10	0	17	3	0

Prices of the Busch "Reflex Camera continued on Page 353.



Taken with a Reflex Camera and a Busch Bis Telar Tele-photo Lens F 7. AUSTRALIANS V.

The stump and ball, NORTHAMPTONSHIRE. Mr. G. A. T. Vials has just been bowled by Mr. C. G. MacCartney (N.S.W.). still travelling, can be seen on the right

EMIL BUSCH OPTICAL Co.,

HATTON GARDEN, LONDON, E.C.

The Busch "Reflex" Camera.

(Continued from Page 351.)

MODEL. $5\frac{1}{2} \times 3\frac{1}{2}$.

	A.	with	"Omnar" Anastigma	No. 3	 	 F 7.7	£17 15	0	
	B.	99	11 11	No. 3	 	 F 5.5			
	C.	99		No. 3	 	 F 4.5			
-	D.	**	"Leukar"	No. 3	 	 F 6.8	19 10	0	
	E.		"Bis Telar"	No. 3	 	 F 9		0	
	F.	19	**	No. 3	 	 F 7	19 0	0	

THE BUSCH "HEDA" Focal Plane Folding Camera.

For Plates $4\frac{1}{4} \times 3\frac{1}{4}$ inches.

Although a low priced instrument, the "Heda" is well made and finished quite in the style characteristic of the Modern Focal Plane Camera.

It opens automatically to infinity, and is instantly ready for exposure. The body and bellows are finished in black, and the plane wood parts

polished. A sliding and revolving panel is provided, thus enabling the lens to

centre as may be required. The shutter is of a very reliable make, having all necessary movements, and speeds up to 1,000th part of a second. The width of the blind opening can be adjusted from outside and time exposures obtained by setting a lever to T and opening



the blind to fullest extent. A direct vision finder is fitted to the top of the camera and two tripod screw bushes for hoizontal and vertical pictures when using a stand.

Three single metal Plate Holders are supplied with camera. The lenses are fitted in helical focussing sunk mounts, with a milled ring iris working from the front, and a scale both for apertures and distances.

The Camera is constructed for lenses about 6-in, focus, and can be had with "Busch" Lenses complete as follows:-

	-							
Model	A.	Camera	and	elides			7	
Model	B.	99	99	11	2.0. 20	-	5	
Model	C.	29	11	22	No. 2½b "Omnar" , F7.7	7	2	6
Model	D.	91	19	19	No. 2½b ,, F5.5	8	5	0
Model	E.	11	19	99	No. 2½b " " F4.5	9	10	0
Model	F.	11	22	93	No. 2b "Bis Telar" F9	5	11	0
Model	G.	11	99	91	No. 2b .,, F7	7	0	0

EMIL BUSCH OPTICAL CO.,

35. Charles Street, Hatton Garden, London, E.C.

Busch "Planor" Focal Plane Camera.



VERY ingenious and high class camera, specially constructed for high speed

instantaneous photography.
It automatically opens to infinity, by means of hinged struts of German silver, constructed to secure perfect rigidity and parallelism between the lens panel and screen. The lens is fitted with a beautifully-made focussing jacket, scaled for distances from 5 ft. to infinity.

The shutter is of the most up-to-date pattern, designed by experts with a knowledge of all the merits and defects of existing focal plane shutters.

The adjustment fittings both for setting and regulating the blind opening are

outside, easy of access, and simple and almost silent in action. The width of the shutter can be regulated to 3 mm, and speeds obtained from

1 to 1,000ths of a second. The body of the camera is of ebonised wood, with nickelled fittings, and black

leather bellows. The lens panel is adjustable, both horizontally and vertically. A direct vision finder is provided with two bushes for use of stand for vertical

and horizontal pictures The camera is supplied with 3 double plate holders of black ebonised wood with

aluminium fittings, well made and beautifully finished.

The workmanship of every part is the best. To those requiring a camera for photographing sporting scenes and rapidly moving objects, the outfit can be accommended as being the best value on the market.

			£ 8. d.
	With 3 double Plate Holders,	44 × 34	£ s. d.
Model A.	With Busch Detective Aplanat No. 2B		8 10 6
Model B.	"Omnar" Anastigmat Series 3, No. 2B		9 10 0
Model C.	,, Ohmai Massignate State 2, 1, 2B		10 5 0
Model D.	" 1 2B		11 0 0
Model E.	"Leukar" Double Anastigmat F6'8, No	. 2B	10 5 0
Model E.	"Bis Telar" No. 2B. F9		8 6 0
34.3.40	9D F7		9 15 0
Model G.	Adapter for Premo Films, 12/ Extra Doub	le Plate Hold	lers. 10/- each.
FIIII Pack	Adapter for Fremo Films, 12/2. Extra 2000		

EMIL BUSCH OPTICAL CO., 35, Charles Street, Hatton Garden, LONDON, E.C.



THE "ALBUM" POSTCARD CAMERA.

For 5½ by 3½ Roll Films and Plates.

The "Album" Postcard Camera is fitted with
the percessary movements of a first-place

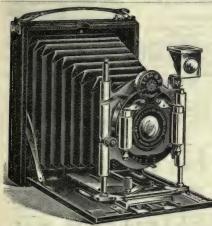
all the necessary movements of a first-class
Camera, and has a rising and sliding front, a rack
and pinion focussing movement and focussing scale
for distances, a Brilliant Reversible Finder, two
bushes for use on stand for both

bushes for use on stand for both horizontal and vertical pictures, and a strut for supporting the Camera as shown in the

illustration.

Each model is fitted with a Wollensak Automatic Shutter, which requires no setting, and gives reliable speeds from 1 to 100th second with time and pneumatic release.

Model A—With Busch Detective Aplanat, F7... £5 12 6 Model B—With Busch "Omnar"



"CHIC"

The Smallest 1 - Plate Camera in the World, fitted with a Speed Shutter from 1 to 100th second.

ONLY ONE INCH IN THICKNESS.

Beautifully made and finished, and covered in real leather. It has a Rack and Pinion adjustment, Rising and Sliding Front, Reversible View Finder, Single Metal Plate Holders, "Busch' Lens, Automatic Shutter I to 100th sec., Special Hooded Focussing Screen.

PRICES, including 3 Slides and Screen, and Envelope— Model A—Busch RR. F8

Lens .. £4 0 0 Model B—Omnar Anastigmat F7.7 .. 6 2 6

Note.—The Camera is so very small that only these two Lenses can be fitted A special feature in so small a Camera is the working of the Rack and Pinon in centre of slide, ensuring the parallelism of the front and back of Camera.

THE SMARTEST CAMERA ON THE MARKET.

EMIL BUSCH OPTICAL CO. 35, Charles Street, Hatton Garden, London, E.C.

THE 'BIS-TELAR'

NEW BUSCH TELE-OBJECTIVES. Two Series 1/7 and 1/9. Bring Telephotography within the sphere of Practical Photography.

A new series of Busch Lenses of remarkable construction, designed to give the Photographer the advantage of telephotography without the inconveniences that attend such work.

The "Bis-Telar" may be described as a long-focus lens which requires only

a short bellows extension.

By its use on an ordinary Hand Camera with the ordinary extension, an image on the obtained approximately twice as large as that given by the lens usually attached to such cameras.

The Busch "Bis-Telar" has the following

advantages :-

1. It is no larger than the ordinary R.R. or Aplanat lenses.

2. It can be fitted to almost any shutter.

3. It is a complete lens requiring no attachments, &c.

 It gives sharp definition at full aperture f/9 and f/7 respectively.
 It can be used for instantaneous exposures,

It can be used for instantaneous exposures, snap-shots, portraiture and landscapes, in Spring, Summer, Autumn and Winter.

 Owing to the small number of reflecting surfaces it produces brilliant pictures.

7. It renders a photographic image with a true and natural perspective.
8. Its use is as simple as an ordinary lens.

With the "Bis-Telar" Lens you can obtain good pictures of long-distance scenery.

good pictures of long-distance scenery.

With the "Bis-Telar" Lens you can obtain a large image for portraits without placing the sitter so near the camera as to produce distortion of the perspective.

With the "Bis-Telar" Lens you can obtain a better and more natural perspective with all your pictures. An illustrated booklet is published on the "Bis-Telar" Lens, which can be had

An illustrated booklet is published on the "Bis-Telar" Lens, which can be had free on application.

SERIES 1/9.

No.	Stand- ard Thread Fl'nges Inches.	Focus in Inches	Camera E'tension necessary for objects at infinity. Inches.	mended primarily	In ordinary Brass Mounts Mod. A.	Prices w Diaphr In Focussing Mount. Mod. B.	agms.	In cells only to fit Shutters, including Leather- covered Pocket Case.
1 2 3	1½ 1½ 2	7 10 14	4± 5± 8±	3½×2½ 4½×3¼ 6½×4¾	33/0 36·0 48/0	51/0 63/0	58/0 61/0 85/6	33/0

SERIES 1/7. In Iris In Focussing In Koilos Camera Focus. For Plates. No. Shutter. Extension Mount. Mount. × 1034 31 2 × 21 5 × 16 × 49

EMIL BUSCH OPTICAL CO. (35, Charles Street, Hatton Gardens, London, E.C.

BUSCH "LEUKAR" ANASTIGMAT



F. 6.8.

In the "Leukar" we have produced a new Series of Anastigmats with an aperture of F/6.8, which is large enough to allow the lens to be used even in unfavourable lighting conditions, and yet secure a mount small enough for use in most of the modern compact hand cameras.

In addition to this important

characteristic that makes it of especial value to the photographer possessed of different-sized cameras, in that the angle of view equals 90°, and it can therefore be used as a Wide Angle Lens on a camera two or three sizes larger than that for which it is listed.

The usual forms of Wide Angle Lenses are constructed to work at an aperture not larger than F/16, and great difficulties are experienced by the photographer in focussing dark interiors with such an aperture.

To such the new "Leukar" Anastigmat offers great advantages, in that he can focus with the full aperture of the lens, and stop down to secure the necessary depth and covering power when making the exposure.

The Back Combination can be used alone.

It has a focus of approximately double that of the complete lens.

In the "Leukar" you thus have an instrument of universal application, it being possible to use the same lens:

- 1. As a Medium Angle Instantaneous Lens on the plate for which it is listed.
- 2. As a Wide Angle Lens on a larger plate.
- 3. Using the Back Combination alone, as a Medium Angle Lens on a large plate.
- 4. Using the Back Combination alone, as a Narrow Angle Lens on the plate for which it is listed, for Telephotography or Long Distance Landscapes, etc.

The covering power of the "Leukar" Lens is sufficient to allow of the use of the rising front to the fullest extent.

The lenses are quite free from the known optical defects, such as spherical and chromatic aberration, curvature of the field, coma, flare, etc., and the astigmatism is entirely eliminated over an angle of 90°.

No.	Size of Flange	Equivalent Focus.	F/6·8 Covershal	F/45 s plate cply.	Mo		Mod B	Model Z	With Unicum Shutter.	With Koilos Shutter.
0 1 2 2 ¹ / ₂ 3 4 5	Ins. 1 114 115 115 115 115 115 115 115 115 1	Ins. 21/2 31/2 51/8 6 71/2 10 13 18	Ins. 13 × 23 24 × 31 25 × 31 31 × 41 43 × 65 7 7 × 9 9 × 12 12 × 15	Ins. 2½ × 3½ 3½ × 4½ 5 × 7 6½ × 8½ 8½ × 10½ 12 × 14 14 × 17 19 × 24	£ 2 3 3 4 5 8 12 20	8. 15 0 15 10 10 15 10	£ 3 5 4 5 6 -	£ 8. 2 15 3 0 3 15 4 10 5 10	£ s. - 4 15 5 10 6 10	£ s

Smaller Disphragm Disphr	With Smaller SERIES A with Helical Unioun Koilon. Diaphragm. as blook. Focus. Jackee. Bhutter. Shutters, 64-53 ins. 116 0 2.7 6 2.16 0 3.5 6 8.7 ×5 ins. 116 0 2.12 0 2.15 0 3.15 8.7 ×5 ins. 116 0 2.12 0 2.15 0 3.15 8.8 ×5 ins. 116 0 2.12 0 2.15 0 3.15 8.8 ×5 ins. 116 0 2.12 0 2.15 0 3.15 8.8 & and 8 can be paired for Stereoscopic work as extra other	Equivalence Foc 5 in 7 in 11 in 11 in 114 in 118 in	Sample Covers Plate Covering Circle Price Price Sample Sample	Med. action over the whole diameter Price. Disphragm. surface of plate. Inches. Price. 42 × 53. surface of plate. 12 st. 112 or 7 × 5 12 × 5 12 × 5 12 or 9 × 7 12 × 5 12 or 112 or 10 × 7 16 × 10 15 or 11 or
BUSCH No. Focus. Cove	TIVE Rouns Aperts Aperts		BUSCH 2 1	WIDE ANGLE APLANAT A

EMIL BUSCH OPTICAL CO. 35, Charles Street, Hatton Garden, London, E.C.

ging china- turn and £4 15 0 ness ame dies £5 10 0	neticio £3 10 0 Series II. k5.5. Series I. F4.5.	With Ordinary Pocussing Unicum Ordinary Febtles Shutter, Modult. Modult. Model A. Model W. Model U. Model A. Model W. M. With W. M. With W. Wi	4 0 0 3 15 0 4 10 0 4 15 0 5 10 0 5 10 0 7 7 6 4 15 0 5 10 0 6 10 0 7 7 6 4 15 0 5 10 0 6 10 0 7 7 6 4 15 0 5 10 0 6 10 0 7 7 6 4 15 0 5 10 0 6 10 0 7 7 6 4 15 0 5 10 0 6 10 0 7 7 6 4 15 0 5 10 0 6 10 0 7 7 6 4 15 0 5 10 0 6 10 0 7 7 6 4 15 0 5 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 6 10 0 7 7 6 10 0 7 7 7 6 10 0 7 7 7 6 10 0 7 7 7 6 10 0 7 7 7 6 10 0 7 7 7 6 10 0 7 7 7 6 10 0 7 7 7 7 6 10 0 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Series II. F3:5 to 4. Series III. F3 to 3:5.	Size Disc. October Disc. Disc. October Disc. Disc. October Disc. Disc. Disc. October Disc. Disc. October Disc.
APLANAT APLANAT SETS, fe. Meoun" Sets. STEREOSCOPIC S as above, but each single Lons of same short for the same series of Lenses STEREOSCOPIC S as above, but each single Lens of same screet forms as above, but each single Lens of same series. SETS. STEREOSCOPIC S as above, but each single Lens of same focus exactly paired. Two Lens bodies are supplied, and two flanges.		BUSCH No. 12 O odge of Mount sing move. 1 September 1	ANASTIGMAT. 24 6 5 × 4 5 1 6 4 2 6 6 × 4 5 1 6 10 0 5 15 0 0 5 15	173 15 × 11 Series I. F4 to	STUDIO STUDIO STUDIO STUDIO INC. Plate. Plate. OCTOBER S. d. 118

EMIL BUSCH OPTICAL CO. Hatton Garden, London, E.C.

BUSCH APLANAT SHUTTER SETS.

Model B consists of the Unicum Shutter and six Lenses, numbered O, I. and II., which, in combination, give foci of 43, 53, 6, 7, and 8; and singly, 93, 12, and 16 inches. Price, complete in case. £5 58.

Model C consists of the large size Unicum Shutter, with six Lenses, numbered I., II., and III., which, in combination, give foci of 6, 7, 8, 9, and 10; and singly, 12, 16, and 20 inches. Price, complete in case



Busch Aplanat Shutter Set.

BUSCH CINEMATOGRAPH PROJECTION.

Lenses in Brass Tubes.

"THE SKYSHADE."

FOR EQUALISING EXPOSURE OF THE FOREGROUND AND SKY.

Enables you to secure pictures with cloud effects from

ONE NEGATIVE.

Can be attached to any Lens in a moment.



Secures a properly exposed foreground in landscapes and street scenes.

Suitable for Lenses of all kinds whether fitted with ordinary Shutters or not.

Write for Particulars, mentioning this Almanac.

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CINEMATOGRAPH

PROJECTION LENSES.

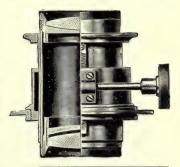
DOUBLE ILLUMINATION.

NEW SERIES.

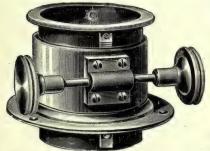
The Objectives of this series give an image twice as brilliant as that given by the ordinary patterns on the market.

The diameter of the lenses is 47 m/m and of the Brass Cylindrical Mount 52.5 m/m, which is the same size as the regular Lantern Lenses.

The Tubes will consequently fit any ordinary lantern jacket.



No.	Equivalent focus.	Back focus.	Price.
11	3g in.	28 in.	In cylindrical brass tubes 40/- each.
12	4 in.	23 in.	
13	4½ in.	31 in.	
14	5½ in.	31 in.	



BRASS JACKET

With double Rack and Pinion and Adapter for all foci.

17/6 each.

EMIL BUSCH OPTICAL CO. Hatton Garden, London, E.C.

BUSCH PRISM BINOCULARS.

FOHR MODELS. FINEST QUALITY. LOWEST PRICES.



Busch Prism Binoculars are of the finest Optical and Mechanical Quality, and are unsurpassed by any others on the market.

The "Ultralux" and "Terlux" Models are advantageous as regards illumination. They give an image respectively twice and three times as bright as that given by other Prism Binoculars.

"The "Lynkop," "Ultralux," and "Terlux" Models are made with central screw focussing movement, and the " Rola" focusses with eye-cup only.

PRICES, WITH BEST SOLID LEATHER CASES-

	Power		6		8			9			12 times.		
"ULTRALUX" "LYNKOP"		6 5	8. 0 10	d. 0 0	61	s. d. 0 0	£	5	d.	£ 7	8. 5	d. 0	
"TERLUX" "STEREO-ULT		" 6	0	0	61	0 0	7	15	0	8	5	0	

EMIL BUSCH OPTICAL CO. Hatton Garden, London, E.C.





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A. Thin Matt Smooth.

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Glossy.

Mauve, Pink and White. Thick-Mauve only.

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POSTCARDS—See p 366.

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Large Size Bromide Paper (10×8 ins. and over) in convenient packets containing a few sheets.

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$7\frac{1}{2} \times 5 \dots \dots$	10 14	10	8	12	1 0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10	12 10	10 B	16 12	2 0 2 0
12 × 10	8	8	6	. 10	2 3
Boxes:			per gross s. d.	per gross s. d.	•
$3\frac{1}{2} \times 2\frac{1}{2} \dots \dots$	3 0	s. d. 3	3 6	2 4	s'
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6 × 4½	9 0	10 0	11 0	7 6	Sizes
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THE BRITISH JOURNAL ALMANAC ADVERTISEMENTS

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Gevaert	All grades	
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Manufacturers of Photographic Papers, etc.

FORDHAM & CO. LTD

PHOTOGRAPHIC MOUNT and ALBUM MANUFACTURERS . .

Victoria Works, Walthamstow, London, N.E. wholesale and export only.

Here is one of our most recent Patterns.

Series No. 9012. A plain board with a linenized surface and surrounded with a darker tint in harmony with the groundwork. The beauty of this mount lies in its adaptability for a variety of prints. The centre is plain and free from any stereotyped ruling or plate - marking, so that the picture can be cut to the most harmonious shape and put on the mount either upright as shown, trimmed to a narrow panel and mounted slightly out of the centre, or treated as a horizontal and mounted above the centre.



The boards are flexible and have plain edges. The backs harmonize with the tint of the front. Altogether a most useful and attractive mount for professional use.

Made in Light Grey for Black and White Prints or Buff for Toned Prints.

Nett prices for the mounts without name stamping.

No. Print Board 100 1000 9012 Cabinet 9 \(\frac{5}{8} \times 6 \frac{5}{8} \) . . . 4/9 42/6

Fordham & Co. Ltd. Victoria Works Walthamstow

An entirely new and exclusive design just introduced.

The mount illustrated below is one of several particularly interesting lines that we are putting on the Market, for the 1910 Season, this is



Series No. 9007. For High Class Studios this mount is distinctive and handsome. The severely s i m p l e style suggests dignity and forms a splendid foil to the richness of photographic n t. These print. mounts are flexible, have plain edges and the backs harmonize
with the fronts.
Made in White or
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corner cabinet prints as shown.

Board, $12 \times 8\frac{1}{2}$. Tint, $6\frac{3}{4} \times 4\frac{5}{2}$. Series No. 9007/31. 100 500 1000 10/- 40/- 75/-

The same mount with cabinet oval. No. 9007/33 at the same prices.

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Christmas greeting folders and cards for export and Colonial trade made by our experienced staff devoting their attention to the work all the year round. Colour printing, binding, embossing, enamelling gilding, all by specialists with the most modern appliances and by the most up-to-date methods

Special Designs in Mounts.

Mounts and folders of board or the new linenized papers designed and submitted to wholesale supply houses and exporters. Specimens and styles in use all over the world submitted. Doing an immense Colonial and export business we can show mounts that will be suitable for photographers in every quarter of the globe. We invite enquiries.

Fordham & Co Ltd. Victoria Works

As the largest manufacturers of Photographic Mounts in Great Britain we have facilities for the production of mounts of every quality and degree. Our standard lines are supplied to wholesalers and exporters at strictly competitive prices.

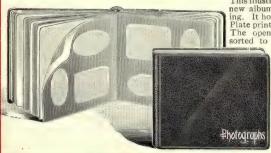
Series No. 9011

Here is another new design an "Osaka" Vellum stiff board with plain edges. Delicately printed in grey or chocolate with a design suggesting the border of an old Mezzotint Engraving. Good and very stylish. Board, 11½ × 8. Address extra.



No.	Print.	100	250	500	1,000
9011/31	Square Oval	12/-	27/6	50'-	95/-

A really beautiful Album bound in Limp Suede Leather



This illustration shows a new album we are making. It holds 96 Quarter Plate prints, 4 on a page. The openings are assorted to take upright and oblong

pictures.
Fine linen
surface, coloured art
paper leaves,
British made
throughout.
Bound in full
limp suede,
brown or
grey.

Price, 5/-

Fordham & Co. Ltd. Victoria Works Walthamstow

New Mounting Papers at very low prices

A new series of mounting papers with a range of eight different tints. The "Victoria" Art Boards are slightly cheaper than the linen surface mounting boards, but the quality is excellent and every colour is a good one. Sample book free on application. Cut sizes to order.

Thin, full size sheets, 20×25 18/- per gross Thick, full size sheets, 20×25 36 - per gross

	This Cover is Sample of THICK and is supplied in all colours.	
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Thin No. 62.		Thick No. 72.
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Thin No. 64.		Thick No. 74.
Thin No. 65,		Thick No. 75.
F No. 66.		Thick No. 76.
han No. 97		Thick No. 77.
Thin No. 68.		Thick No. 78.

Enquiries

Remember, we have the largest and most up-to-date factory for the manufacture of Photographic Mounts, Albums, etc., in the United Kingdom, and are constantly producing new styles in colour and design for high class work. We therefore specially invite enquiries for samples and quotations for all grades of work at competitive prices, but we can only deal with Wholesale and Export orders. Did you see the photos of our works in last year's B.J. Almanac?

Price Lists on Application. Wholesale Only.

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Australia:
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LANCASTER'S CAMERA CATALOGUE FOR 1910

will be ready on March 1st, 1910. In it will be found particulars of many new cameras—especially in the Reflex type. The world-renowned "Lancaster Value" will be found to be as high and in some instances even greater than hitherto. Make a point of writing now for a copy of this Catalogue to be forwarded to you as soon as ready.

In the following pages we give illustrations and prices of one or two of our leading lines, but they represent only a very small proportion of the various kinds of apparatus that we make.

J. LANCASTER & SON, Ltd.

ESTABLISHED 1835,

BROAD STREET, BIRMINGHAM.

Telegrams | "LANKSTER, BIRMINGHAM." & Cables | A.B.C. Code, 5th Edition.

National MIDLAND, 216."

Lancaster Anastigmat Lenses.

THE "ANASTIGMAT RECTIGRAPH."

Series IV., Aperture f/5'3.



A UNIVERSAL LENS OF THE HIGHEST POSSIBLE QUALITY

UNEQUALLED FOR DEFINITION AND COVERING POWER

Corrected in the highest degree for Chromatic Aberration, Astigmatism and Distortion. Absolute freedom from "ghost" or "flare." The back combination is a fully corrected anastigmat of considerable rapidity, and with an aperture of f/ix will cover the same size plate as the complete lens. The front combination is also an excellent landscape lens. This Lens is therefore three lenses in one, two of which are rapid Anastigmats.

PRICES.

No	Focus of Combination.	Focus of Back Lens.	Plate covered at Full Aperture.	Price in "Iris" or Sunk Mount.	Price in Focussing Mount.	Price in "Ibso" or "Automat" Shutter.	Price in "Koilos" or Compound Shutter.
1 2 3 4 5 5	4 ⁷ / ₄ 56 7 84 92	84 94 104 124 144 164	44 × 34 5 × 4 52 × 4 52 × 4 62 × 6 82 × 6 82 × 6 83 × 6	£ s. d. 3 15 0 4 10 0 5 5 0 6 0 0 7 10 0 9 0 0	£ s. d. 4 5 0 5 0 0 5 15 0 6 15 0 8 5 0	£ s. d. 5 0 0 5 15 0 6 15 0	£ s. d. 5 10 0 6 5 0 7 0 0

Series V., Aperture f/4'5, for High-Speed Photography. PRICES.

No.	Focus of Combination.	Plate covered at Full Aperture.	Price in "Iris" or Sunk Mount.	Price in Focussing Mount.
1	51	-4½ × 3½	\$ s. d. \$ 15 0 4 0 0 4 15 0 5 10 0 8 0 0	£ s. d.
2	6	5 × 4		4 5 0
3	7	5½ × 3½		4 10 0
4	81	7 × 5		5 10 0
5	9	8½ × 6½		6 5 0

The "Euryscope Rectigraph" Anastigmat. No. 376.

Aperture 1/6 to f/10.
PRICES.

1-plate, £2; 1-plate, £3; 1/1-plate, £4; 10 × 8, £5; 12 × 10, £6; 15 × 12, £7.

Lancaster Telephoto Attachments.

The 'Telephoto' Attachment.



Series I. and II.

Can be adapted for use with any R.R. or Anastigmat Lens, and trebles the scope & range of your ordinary Lens.

The Telephoto Attachment is made in three sizes in each series to take any R.R. or Anastigmat of 5 to 9 in. focus. The negative lens is fitted in Rackwork Mount, engraved with all the necessary data up to eight times magnification.

We give below tables for the Nos. 1 and 3 when used with a 6 in. and 8 in. R.R. Lens respectively.

Particulars of No. 1 when used with a 6 in. focus R.R. Lens:

Number of times object is magnified.	Extension of Camera necessary.	Focus of Lens required to give the same size view as Telephoto Lens.	Size of Plate covered.
2	23 ins.	12	23×2
3	5½ "	18	43×31
4	81 "	24	· 61×42
5	II "	30	8 × 5
6	134 "	36	9 ×7
8	194 "	48	12 × 10

Particulars of No. 3 when used with an 8 in. focus R.R. Lens:

Number of times object is magnified.	Extension of Camera necessary.	Focus of Lens required to give the same size view as Telephoto Lens.	Size of Plate covered.
2	3 ins.	16	2½×2
3	3 "	2.4	44×34
4	9 "	32	6½×4¾
5	I2 s	40	7 × 5
6	15 "	48	9 ×7
. 8	21 "	64	12 × 10

PRICES:

		No. 1.			No. 2			No.	3.
		ise with to 6 in.							Lenses focus.
Series I. Series II. Triple	1	5 S.	d 0	£	s. 11	d. B	£	s. 2	d. 0
Achromatic Lens	1	15	0	2	2	0	2	12	6

Lancaster Daylight Loading Slide.

strongest sunlight.

The "Eureka" Daylight Loading Slide

AND FOCUSSING SCREEN COMBINED, FOR PLATES AND FILMS.

Entirely supersedes Roll Films and all other systems of Loading Plates or Films.

Focussing Hood dispenses with Focussing Cloth, even in



THE SLIDE in which the envelopes are used is constructed of selected Hardwood, Leather-covered, with Aluminium fittings. It is fitted with a Ground Glass Focussing Screen, with Folding Hood attached, the Slide taking the place of the ordinary Ground Glass Frame, thus there is no addition to the weight of Camera. The Ground Glass is at the back of the Slide when exposing, and automatically sets itself to the correct register for focussing.

THE ENVELOPES for carrying the Plates and Films are made of strong black paper, combining the maximum of strength and wearing qualities with the minimum amount of weight; they can be used over

and over again for any number of exposures.

We make Envelopes for both Plates and Flat Films.

The Envelopes can be filled with any make of Plates or Flat Films. The method of exposing the Plates or Films is of the most simple character; it is absolutely safe and light-tight, and it is impossible for it to fail or get out of order.

The Envelopes are made with a special light-trap, so that they can be handled in the strongest light without fear of fogging the most

sensitive film.

PRICES:

1-pl. and 5 × 4 and 1-pl. and 9 × 12 cm. Post-Card. 13 × 18 cm.

Eureka Slide

Envelopes for Plates or Flat Fiuns, per doz.

5/
These Slides can be fitted to almost any existing Camera using dark slides at a cost of from 2/- to 3/- extra.

Lancaster Reflex Cameras.

The 1910 No. 6 "Plano-Reflex" Camera



Rotating Reversing Back, for Horizontal and Vertical Pictures in all sizes.

Square Focussing Finder with Patent Automatic Mask.

SPECIFICATION:-

LONG TRIPLE EXTENSION .-

We give below the maximum and minimum extensions of the various sizes. The work ng parts of the tailboard are brassbound, ensuring smooth and exact working. Real leather bellows of finest quality. Large focussing nut on left hand side. Focussing clamp nut on righ hand side.

Lenses for use with any of these Cameras must have a focal length from the back of flange of not less than the minimum extent sion of camera.

Size.	Dimensions.	Maximum Extension.	Minimum Extension.	Weight.
1-pl. 5 × 4 5 × 3 ½ ½-pl. 7 × 5	6 × 6½ × 6½ ins. 6 × 6½ × 7 ,, 8 × 8½ × 8½ ,, 8½ × 8½ × 8½ ,, 8½ × 9 × 9½ ,,	12½ ins. 14½ ,, 17¼ ,, 17¼ ,,	6½ ins. 7 " 8½ " 8½ " 8½ "	41 lbs. 44 '' 61 '', 71 '', 81 '',

IMPROVED FRONT of new construction, absolutely rigid at the fullest extension so that the axial pencil of light always strikes the plate at exactly right angles. This is most essential with the highly corrected modern lenses used at large apertures.

EXTRA HIGH RISE TO FRONT. Lens panel quickly and easily removable. THE MIRROR is silvered on the surface and highly polished, giving a brilliant image on the Finder in exact focal register with the plate. The one release raises the Mirror, releases the Shutter, and resets the Mirror in position again. No capping of the Shutter is therefore necessary, the plate being uncovered during the exposure only. The necessary movements of the Mirror and Shutter are obtained with perfect smoothness, quite free from the least trace of vibration.

THE SQUARE FINDER is fitted with a new patented automatic movement. The Finder is provided with a Mask, which is automatically changed from the vertical to the horizontal, or vice versa, by the one movement of rotating the reversing back.

The 1910 No. 6"Plano-Reflex" Camera.



DEEP FOCUSSING HOOD, hinged. enabling focussing screen and mirror to be easily cleaned. Focussing screen at back of camera for use on tripod. The FOCAL PLANE SHUTTER is of the

very best construction that experience can devise, and is absolutely reliable. Altered from the outside of camera, which can be effected after the shutter has been set. The instantaneous exposures range from 1 a second up to Tanth of a second. Speed scale with full range of speeds is fitted. Time exposures of any length with independent release, to which pneumatic or antinous release can be fitted.

Each Camera is most carefully tested and adjusted, to ensure

only instruments of perfect precision being sent out.

PRICES OF THE 1910 No. 6 'PLANO-REFLEX' CAMERA. The Prices with the various Lenses are for Camera and Lens only.

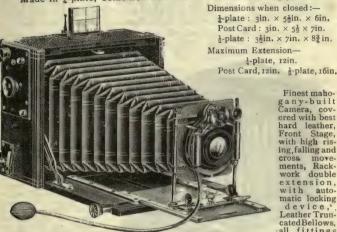
Prices of Cameras only (no plate-holders) with the following Lenses:—	‡-plate.	5×4.	Post-card, $5\frac{1}{2} \times 3\frac{1}{4}$.	½-plate, or 7×5.
With "Euryscope Rectigraph" f/6 Lens "Anastigmat Rectigraph" f/6 " " f/5 3 " " f/5 3 " " Aldis" Anastigmat f/6 Lens " Beck "Isostigmar "f/5 8 " " Busch Omnar f/4 5 Lens " Goerz "Dagor" f/6 8 " " Celor" f/4 8 " Camera only, without Plate-holders or	12 17 6 14 15 0 15 0 0 15 5 0	S. d. 11 18 0 12 15 0 15 15 0 13 15 0 14 7 6 13 17 6 17 12 0 17 5 0 17 5 0	£ s. d. 14 0 0 16 15 0 18 10 0 16 10 0 16 5 0 20 15 0 18 10 0 19 18 0 20 5 0	£ s. d. 16 10 0 19 5 0 21 0 0 19 0 0 18 15 0 23 5 0 21 0 0 22 5 0 22 15 0
Lenses "Eureka" Daylight Loading Slide, see page 374	.8 15 0 0 16 0	9 15 0 0 16 0	0 16 0	1 0 0
Envelopes for Plates or Flat Films for ditto, per doz	0 5 0	0. 6 0	0 6 0	0 7 0
Double Plate-holders	1 2 6	1 5 8	1 5 6	1 10 0
Double Plate-holders, with draw- out Vulcanite Shutters Hardwood Adapter for Film Pack Best Quality Solid Leather Case	1 5 6 0 12 0 0 17 6	1 8 6 0 15 0 1 0 0	1 10 0 0 15 0 1 5 0	1 10 0 0 18 0 1 7 6

J. LANCASTER & SON, LTD., BIRMINGHAM.

Lancaster Focal Plane Cameras.

The Folding Focal Plane Camera.

Made in 1 plate, Combined Post Card and Stereo, and 1-plate.



Finest mahogany-built Camera, cov-ered with best hard leather, Front Stage, with high rising, falling and cross movements, Rack-work double extension, with automatic locking device. Leather Truncated Bellows. -all fittings

nickel - plated, Focal Plane Shutter of very latest construction, giving instantaneous speeds from \(\frac{1}{2} \) to \(\frac{1}{1500} \) th of a second (Speed Scale, with full range of speeds), and Time Exposures of any duration, Direct Vision or Brilliant View Finder, Leather Focussing Hood to ground glass, protecting same when not in use, Leather carrying Handle, Focussing Scale, &c.

WITH THREE SINGL	B PLATE	HOLDE	RS.	
	Post Card with one lens only. $5\frac{1}{2}$ in. × $3\frac{1}{2}$ in.	with 2	}-plate.	½-plate.
Without Lens "Rectiplat" Lens //73 ", "Euryscope Rectigraph" //6 Lens ", "Anastigmat Rectigraph" //6 Lens ", "Anastigmat Rectigraph" //6 Lens Lens ", "Aldis Anastigmat" Series II. //6 Lens Extra cost for "Eureka" Daylight Loading Slide in place of Plate Holders Envelopes for Plates or flat films, per doz. Removable Stereo Division extra. Metal Film Pack Adapter Extra for Unicum Shutter on front	8 0 0 9 0 0 10 15 0 7 12 6 0 12 6	£ s. d. \$ 13 0 8 0 0 10 0 0 12 0 0 13 0 0 8 16 0 0 12 6 0 6 0 0 6 0	£ s. d. 4 10 0 5 17 6 6 10 0 7 10 0 9 0 0 6 3 0 0 12 6 0 5 0 0 4 0 1 5 0	£ s. d. 5 15 0 7 10 0 8 15 0 10 0 0 11 15 0 9 12 6 0 7 0 — 2 10 0

Quotations for Camera fitted with other Lenses per return on request.

Lancaster Folding Plate Cameras.

KAMREX-DE-LUXE."

Made in 1-pl., 5×4, and 1-pl. sizes.

Four-way Swing and Reversing Back, Rackwork Double Extension. Dimensions.— $\frac{1}{2}$ -pl., $5\frac{1}{2} \times 5\frac{1}{5} \times 2\frac{1}{2}$; 5×4 , $6\frac{1}{2} \times 6\frac{1}{2} \times 2\frac{1}{2}$; $\frac{1}{2}$ -pl., $8 \times 8 \times 3$. Weight.— $\frac{1}{2}$ -pl., 2 lbs.; 5×4, 2\frac{3}{2} lbs.; \frac{1}{2} \cdot pl., 3\frac{1}{2} lbs. Maximum Extension. -\frac{1}{2} \cdot pl., 10 ins.; 5×4, 11 ins.;



The "Kanırex-de-Luxe" is a soundly constructed Camera suitable for long hard wear in any climate. Covered in hard Morocco eather, Aluminium Front Stage with High Rising. Falling and Cross Move-ments, Rackwork Double Extension. Four - way Swing and Reversing Back, Hooded Focussing Screen, Focussing Scale, Brilliant Reversible Finder with Circular Level attached, Bush for Tripod, Leather Carrying Handle, Book - form Mahogany Double Plate-holder.

Supplied with the new "Ibso" or Bausch and Lomb "Automat" Sector Shutter, and the following Lenses at prices as below .

_	⅓-plate.	5×4	½ plate.
With "Special" Symmetrical f/8 "Rectiplat" f/73 "Euryscope Rectigraph" f/6 Anastigmat "Anastigmat Rectigraph" f/6 "Aldis "Anastigmat," Series II. f/6 Extra for "Koilos" Shutter in place of the "Ibso" or "Automat" Extra for "Eureka" Daylight Loading Slide instead of Double Dark Slide	\$ s. d. 3 3 0 3 15 0 4 7 6 5 7 6 6 17 6 4 7 6 0 15 0 0 12 6	£ s. d. 4 4 0 4 16 0 5 10 0 6 10 0 8 0 0 5 10 0 0 15 0	£ s. d. 6 0 0 6 15 0 7 15 0 9 0 0 11 15 0 7 15 0
Envelopes for Plates or Films, per doz. Extra Double Plate-holders Solid Black Leather Case	0 5 0 0 6 0 0 10 6	0 6 0 0 8 0 0 12 6	0 7 0 0 10 6 0 15 0

The 1910 "Kamrex-de-Luxe" is also supplied with the Bausch and Lomb new "Simplex Auto" Sector Shutter with indicated speeds of 1/25th. 1/50th and 1/100th of a sec. with any of the above Lenses at 10/6 less than the above prices.

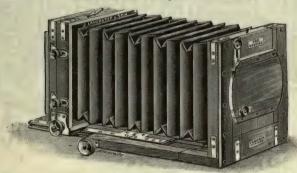
Lancaster Square Bellows Camera.

The 1910

Improved "Special" Camera

(BRASS BOUND.)

Made in all sizes from 1 plat to 15 × 12.



The "Special" Camera introduced by us in the year 1886 is the original design of this type of camera, and has been copied but never excelled by many makers. Every possible cave is taken in its manufacture to ensure only perfect cameras being sent out, and the steady sale this model experiences in all parts of the world is proof of its unique merit.

The Camera is constructed of the very finest long-seasoned Spanish mahogany, clamped, screwed and strongly brass-bound, wherever possible. Real Leather Bellows, Rackwork Double Extension, Four-way Swing Back, Rising and Cross Front, Reversing Back, etc., etc.

	CAMERA	AND ON	NE BRA	SS-BOUND	SLID	E.
338	339	340)	341	342	343
1	0 £4 0	I/			XIO I	5 × 12-plate.
£2 10	0 £4 0	0 £5 0	0 £6	0 0 £7	0 0	£8 0 0

COMPLETE SETS.—"Special" Camera, Double Dark Slide, and Best Polished Folding Stand, fitted with the following Lenses, without Shutters, or with Shutters at extra prices as below:—

Lancaster's "Special" Symmetrical f/8 Lens	1-plate.	2-plate.	-plate.
	£3 10 0	£5 0 0	£6 10 0
	4 15 0	6 15 0	9 0 0
	7 5 0	9 15 0	15 10 0
Extra cost fitted with Behind Lens Roller Blind Shutter, with Speed Indicator	0 9 0	0 10 0	0 10 6

Lancaster Triple Extension Stand Cameras.

The 1910 "Excelsior Instantograph."

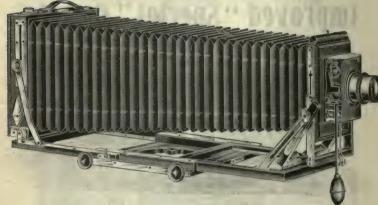


Illustration shows Camera with the Swing Front slightly extended.

SPECIFICATION-

CAMERA constructed of seasoned mahogany highly polished, Real Leather

Bellows, of extra large size at front.

Bellows, of extra large size at front,

THE MOVEMENTS are all that the most expert photographer can possibly desire. Universal Rising, Falling, Swinging and Extending Front, Automatic Spring Locks to all movements for the normal positions. Independent Panel Rise and Cross Movement, Automatic Locking Stretchers to back of Camera, Four-way Swing Back, Reversing Back, Triple Extension by double racks and pinions, Plumb Indicator, Circular Level, Solid Brass Cast Turntable Top.

THE DOUBLE PLATE-HOLDER is of finest mahogany.

ROLLER BLIND SHUTTER, giving Time and Instantaneous Exposures with Speed Indicator.

with Speed Indicator.

THE TRIPOD is of best quality ash, three-fold.

PRICES. Camera, Slide, Shutter, Tripod, and any of the following Lenses:-

		-pl			₫-pl		1	/1 p	ol.	I	ox	3	12	2×1	0
With Lancaster "Special" R.R. Symmetrical f/8 Lens							1					1	£ 12		
With Beck "Symmetrical" f/8 or "Busch" Lens ,, "Euryscope Rectigraph"	3	5	0	3	15	0	5	17	6	10	10	0	12	5	0
f/6 Anastigmat or "Aldis" /16 Anastigmat (½-pl. and 1/1 pl., f/7'7) "Anastigmat Recti-	4	5	0	4	15	0	8	0	0	13	0	0	15	0	0
graph '' f/5'3								7			-			-	
Anastigmat Extra Double Dark Slides Solid Leather Case, black or tan	0	6	6	000	8	6	0	14	6	1	10	0	1	5	0

Lancaster Magazine Hand Cameras.

"INVINCIBLE-DE-LUXE."

Made in 4-plate size only.



The "Invincible-de-Luxe" is built of finest Mahogany, clamped, screwed and brass-bound at every joint. It will stand long hard wear in the hottest and dampest climate. Rackwork Focussing Adjustment with Long Extension, Leather Bellows, Reversible Brilliant Finder, Rising, Falling and Cross Front, two Circular Levels for horizontal and vertical positions, Infallible Plate Changing Mechanism with Plate Recorder, Bushes for Tripod, for vertical and horizontal, solid Leather Carrying Case, etc., etc.

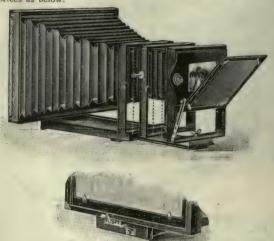
PRI	CES						
	,	B.&L. Sector		at'' er,	With " "Com Sh see	pou	r,
With "Rectiplat" f/7'3 Lens "Euryscope Rectigraph" f/6		£ 4	s. d.	11	. £	s. 5	d. 0
Anastigmat		5 7 5	5 0 15 0 5 0		5 8 5	17 7 17	6 6
", Goerz "Syntor" Anastigmat f /6.8 "Dagor" Anastigmat f /6.8		6 8	17 0 7 6		7 9	9	6

Any jurther particulars desired will gladly be sent on application.

Lancaster's No. 2 "Amatem

ENLARGING, COPYING AND REDUCING CAMERA

is fitted with two Wynche Focussing Screws at the Ground Glass end of Enlarger, operating on the centre portion carrying Lens and the end carrying Negative, thus enabling the desired size of enlargement and fine focussing to be obtained with the utmost ease and accuracy, the image on the ground glass being in view the whole time. We can also supply this Enlarger without Lens for use with customer's own Lens at prices as below.



The Enlarger is strongly made throughout. The Negative end is fitted with selfcentring Carrier and a special light reflector, diffusing the daylight quite evenly over the whole Negative. The Camera is fitted with special Achromatic Enlarging Lens, the whole regarde. The Camera is fitted with special Actionatic Enlarging Lens, two Diaphragms, Exposing Shutter, Fine Ground Glass Focussing Screen, Removable Dark Slide for Plates or Bromide Paper, &c., &c.

Prices complete to enlarge from 1-pl, and 1-pl, negatives to any size up to :—

10×8 £2 5 0 12×10 £2 12 6 15×12 £3 0 0

Extra cost for Special R.R. Enlarging Lens, 10×8 7/6 12×10 10/- 15×12 10/-

Prices of Enlarger complete, but without Lens (oustomer's own Lens to be used):—

10×8 £2 0 0 12×10 £2 7 6 15×12 £2 15 0

Carriers for Dark Slide: -1, 5 × 4, 5\(\frac{1}{2}\) × 3\(\frac{1}{2}\), \(\frac{1}{2}\), \

is similar in build to the No. 2, but without the two Wynche Focussing Screws and Reflector.

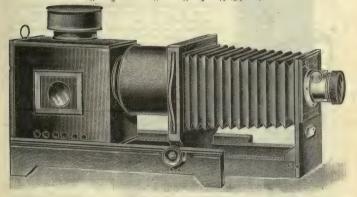
Will enlarge from 1-pl. or 1-pl. Negatives, and is fitted with Focussing Adjustment, enabling any size enlargement to be made up to the full size of camera. Self-centring Carrier, enabling Correction of Negatives, or Enlargement of any particular portion. Special Enlarging Lens and Diaphragms, with Exposing Shutter. PRICÉS 10×8 .. 30/- .. 12×10 .. 35/- .. 15×12 .. 40/-

Lancaster's 'Excelsior' Enlarging Lantern

An enlarger of excellent design and of the best construction at a remarkably low price. Undoubtedly the BEST VALUE in Enlarging Lanterns procurable.

Supplied with or without Objective in the following sizes:-

With $4\frac{1}{2}$ in. Condenser for $3\frac{1}{2} \times 2\frac{1}{2}$ or $3\frac{1}{4} \times 3\frac{1}{4}$. $5\frac{1}{2}$ in. $\frac{1}{4} \times 3\frac{1}{4} \cdot \frac{1}{4}$ -plate). $\frac{6\frac{1}{2}}{2}$ in. $\frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} \cdot \frac{1}{4}$ or Postcard. $\frac{6\frac{1}{4}}{2} \times \frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4} = \frac{1}{4}$



WOODWORK OF SOLID OAK, all joints dovetailed and screwed together.
VERY RIGID FRONT extended by double RACK and PINION.

EXTRA LONG EXTENSION of sufficient length for enlarging or reducing to lantern slides.

REVERSIBLE CARRIER for horizontal or vertical negatives and allowing any portion of the negative to be placed in centre of the condenser.

LANTERN BODY of real RUSSIAN IRON taking any illuminant. Light-tight Cowl and two-draw extension tubes. Sliding motion to lantern body for adjustment of light.

PLANO-CONVEX CONDENSER of the best quality mounted in oxidised brass cells.

PORTRAIT OBJECTIVE with RACK and PINION FOGUSSING ADJUSTMENT and RIS DIAPHRAGM. Orange Cap for adjusting paper.

With Without PRICES:-Objective. Objective. With 4½ in. Condenser for 3½ × 2½ ... £2 2 0 £1 15 0 ,, 1-plate ... ,, 5 × 4 or F 12 6 5½ in. 2 2 50 0 5 × 4 or Postcard 12 6 3 3 3 0 22 13 " -plate .. 5 5 0 4 10 0 . . Incandescent Burner, Jet, etc., 5/-Three-wick Oil Lamp, 66 Nernst Filament Electric Lamp, 12/6 Spirit Vapour Lamp, 10/6 Acetylene Jet, etc., 7/6

Write for FULL ENLARGING APPARATUS CATALOGUE, giving Full Particulars of Enlarging Lanterns u, to £25.

Lancaster's 1910 "Ellipsoid" Enlarger



The most popular Enlarging Apparatus ever in-

Produces perfect enlargem nts crisp and clear from

Converts your own camera into a complete En-larging Lantern for only a few shillings expendi-

An artificial light enlarging apparatus in which the need of costly condensers is entirely and most successfully obviated. The employment of a special reflector, most ingenious both as to surface and shape, gives a pertectly diffused light, so soft and white in character that enlargements of the highest possible quality are produced with ease.

Model in Four Models and each Model supplied in

three Forms:—(Form A) for use with your own cam ra and lens, or (Form B) with bellows front and

focussing adjust-ment, for use with your own lens only, or (Form C) with bellows front and special enlarging lens as a complete enlarging lantern. Illustration shows Forms B and C.

Made for use with ordinary coal gas, electric light, acetylene or incandescent spirit.

SPECIFICATIONS:

The No. 3 "ELLIPSOID" ENLARGER. Lantern body of japanned tin, large cowl of improved design carrying all heat from burners.

In Form A, for use with customer's own camera and lens, the connecting portion to customer's camera is of polished walnut with asbestos lining between

lantern body.

In Form B, for use with customer's own lens only, a bellows extension is fitted with focussing screw adjustment. A special universal lens adapter is fitted to the lens panel, taking any lens with an internal flange diameter of from 11 to 2 inches.

In Form C, a special R R. Enlarging Lens is supplied, fitted with two sliding stops, //6 and //10, giving enlargements of excellent definition.
In the No. 3, in the 4-plate, 5 × 4 and Post-Card sizes, one high pressure inverted burner is fitted. In the 4-plate and 1/1-plate sizes, two inverted burners are fitted.

The No. 4 "ELLIPSOID" ENLARGER is of the same construction as the No. 3, but is fitted with two high pressure inverted burners in the ½-plate, 5 × 4 and Post-Card sizes; and three inverted burners in the ½-plate and 1/1-plate sizes.

The No. 5 "ELLIPSOID" ENLARGER. Lantern body of Russian fron, fitted with two inverted incan escent burners in the 1-plate, 5 × 4 and Post-Card sizes; and with three in the 1-plate and 1/1-plate sizes.

The No. 6 "ELLIPSOID" ENLARGER. Lantern body of Russian iron, fitted with two special improved spirit ineandescent burners with spirit reservoirs. This model is specially constructed for use in India and the Colonies, or for wherever gas or electric light are not available. It is completely self-contained and generates its own gas.

PRICES OF THE "ELLIPSOID" ENLARGER. etc.

We can supply from stock any of the Form A "Ellipsoid" Enlargers to fit cameras of our own manufacture or those of Messrs. Houghtons, Butchers Thornton-Pickard, Kodak, or the M.C.C., but it is necessary for customers to tell us the name of the camera and, if possible, the date. To fit cameras of other makers, all that is necessary is to send us either the back of the camera or one of the plate holders. A negative carrier is supplied with each Enlarger.

T	D	T	0	873	CH	

Management of the Control of the Con	}-plate.	5×4 or Post Card.	½-plate	1/1 plate.
The No. 3 " Ellipsoid " Form A	£ s. d. 0 12 6 0 15 0 1 1 0 1 11 6 1 1 0 2 1 6 1 10 0 2 1 6 1 6 0 1 8 6 1 15 0	Fost Card. £ s. d. 0 15 0 1 7 6 1 5 0 1 7 6 1 7 6 1 15 0 1 7 6 1 15 0 1 15 0 1 15 0 1 1 7 6 1 15 0 1 1 7 6 1 1 10 0 1 10 0 1 12 0	S. d. 0 18 0 1 1 0 1 10 0 2 5 0 1 8 0 1 11 6 2 2 17 1 15 0 1 18 0 2 10 0	£ s. d. 1 5 0 1 10 0 2 0 0 2 15 0 1 16 6 2 2 0 2 12 0 3 7 0 2 15 0 2 10 0
Opal Reflectors for replacing	2 6 6 0 1 0	2 10 0 0 1 6	3 5 0 0 2 0	3 15 0 0 2 6

Extra Inverted Incandescent Mantles, 5d. each.

The "Ellipsoid" Enlarger for Acetylene or Electric Light.

We can supply any of the "Ellipsoid" Enlargers fitted with burners for acetylene or with fittings for electric lamps (lamps not included) at the same prices as with the inverted incandescent burners. When ordering for acetylene or electric please specify distinctly.

Acetylene Generators for Acetylene "Ellipsoid."-No. 1, 15/-; No. 2, 18/6.

The "Ellipsoid" Enlarger in the Continental sizes.

We can supply any of the "Ellipsoid" Enlargers in the Continental sizes as follows: -9×12 cm. at the same prices as the $\frac{1}{2}$ -plate. 18 \times 24 at the same prices as the $\frac{1}{2}$ -plate. We can also supply the 7×5 size at the same prices as the $\frac{1}{2}$ -plate.

EXTRAS:-

Carriers for Smaller Negatives.-1/- each.

Flexible Metallic Tubing for connecting Enlarger to gas supply, with rubber connections, per length:—4ft., 1/3; 5ft., 1/6; 6ft., 1/9; 8ft., 2/3; 10ft., 2/9. Longer lengths, 3d. per foot extra.

Orange Caps for exposing 1 to 11 in. diameter, 1/- each; 11 to 2 in., 1/3 each

Lancaster's Catalogue of Enlarging Apparatus.

Enlarging Cameras, "Ellipsoid" Enlargers, Enlarging Lantern, Easels, etc., etc. Post free on application.

Lancaster's Catalogue of Photographic Accessories & Supplies.

Containing over 110 illustrations. Post free on request.

Lancaster's Catalogue of Optical Lanterns & Accessories, etc.

Post free on application.

Lancaster's Catalogue of Optical Apparatus.

Telescopes, Microscopes, Barometers, Electrical Apparatus, etc., etc., etc., Post free.

Lancaster's "IDEAL" Telescope



is only the size of a cigar, yet twice as powerful as a Prism Binocular costing £8 8 0. Eighteen miles distance appears through the No. 5 "Ideal" Telescope equal to one mile with the naked eye.

PRICES, complete in Leather Bag :-

No. 1—Magnifying 9 diameters. Weight 3½ oz	£o	12	6
No. 3—Magnifying 12 diameters, and fixed with Fine Focussing Adjustment. Weight 402	1	-1	0
No. 5—Magnifying 12 and 18 diameters, with Pancratic Eyepiece and Fine Focussing Adjustment. Weight 5 oz.	1	5	0

J. LANCASTER & SON. Ld.

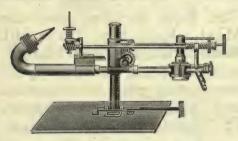
275, Broad Street, Birmingham.

THE NEW

GWYER

SPECIAL CINEMATOGRAPH

LIME-LIGHT JETS.



Nearly every lanternist of experience is now using the GWYER

JET, which is the best proof of superiority.

The new type gives considerably more light with less gas. It will suit smaller lanterns, short focus condensers, and can be supplied with mechanical tray.

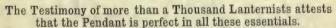
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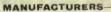
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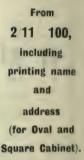
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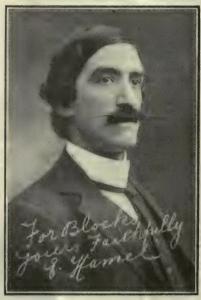
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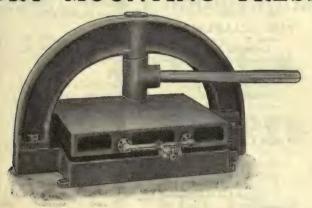
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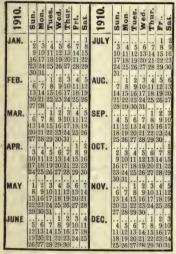
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APR.		20 27 3	28	29	30	31	25 1 8 15	OCT.	17 24 1 8 15	25 2 9	26 3 10	20 27 4 11 18	28 5 12	6	7
MAY	16 23 30 	24	25	19 26 ···3	20 27	21	22	NOV.	22 29 5	23 30 6 13	24 31 ··	25	26	27 3 10	28
JUNE	14 21	15 22 29	16 23 30	17 24 31		19 26	20 27	DEC.	19 26	20 27 	21 28	29	23 30 	24	25
	11 18	12 19	6 13 20 27	14	1 8 15 22 29	23	10 17 24			11 18 25		20	14 21 28	22	23

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-			JANUARY.					
The same of the same	D. M.	D. W.	REMARKABLE EVENTS.		SUN. ses.Se m. H.		Rises.	ON. Sets H. M.
1	1	S		8	8 4	0	10a24	11 28
-	2	5	2nd Sunday after Christmas	8	84		11 33	
1	3	M	(1.27 A.	8	84		11 57	
1	4	Tu	First R.P.S. Exhibition, 1854	8	8 4	3	0m41	0a7
1	5	W		8	74	4	1 49	0 21
1	6	Th		8	74	5	2 58	0 37
1	7	F		8	74	8	5 22	0 57
-	8	5	1st Sunday after Epiphany	8	64	10	6 34	1 59
-	10	M	German Copyright Act, 1876	8	64	11	7 40	2 48
1	11	Tu	• 11.51 M.	8	54	12	8 34	3 51
1	12	W	- 12.02 M	8	54	14	9 17	5 6
1	13	Th	Wm. Bedford d. 1893.	8	44	15	9 49	6 29
1	14	F	Prof. Ernst Abbè d. 1905	8	34	16	10 14	7 54
1	15	S		8	24	18	10 34	9 18
1	16	5	2nd Sunday after Epiphany	8	14	20	10 59	
1	17	M	[Washed Emulsion, Bolton, 1874		14	21	-	
}	18	Tu	Finder invented (Taupenot) 1856	8	0 4		11 23	
ı	19	W	Henry Boissonnas d. 1889 [D 10.21M.		59 4		11 42	
1	20	Th		7	58 4	25	0 a 5	2 50
ı	21	F		7	574	26	0 34	
	22	S	~ · · · · · · · · · · · · · · · · · · ·	7	56 4 55 4	28 30	1 13 2 5	
	23	5	Septuagesima Sunday	7	544	32		
ł	24	M· Tu	Talbot's Prints first shown, 1839	7	53 4	33	()	
	25	W	Oll.51 M.	1.	52 4	35	5 38	
	27	Th	[O11.51 M.	7	51 4	37		,
	28	F	Photo-sculpture pat. by Willème	100	504	39		1
-	29	S	[1863	3	474	41	9 17	
-19	30	5	Sexagesima Sunday	7	45 4	42	10 25	10 0
	31	M	-	7	434	43	11 33	10 13

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		FEBRUARY					
D. M.	D. W.	REMARKABLE EVENTS.			Sets.	Rises.	OON. Sets. H. M.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	TW THE SSM TW THE SSM TW THE SSM	J. R. Johnson's carbon pat., 1869 Quinquagesima Sunday [Print made by Talbot, 1836 Calotype Process pat., 1841 Sir David Brewster d. 1868 1.13 M. Fox Talbot b. 1800 1st Sunday in Tent D 6.35 A. [schel's paper at Royal Soc., 1840 2nd Sunday in Tent. Sir John Her- Talbot's paper at Royal Soc., 1839 O 3.36 M. 3rd Sunday in Tent.	777777777777777777777777777	42 4 41 4 40 4 33 4 33 4 33 4 33 4 32 9 52 7 52 20 5 18 5 14 5 20 5 5 4 5 20 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	4 48 4 500 4 51 1 53 1 55 5 57 5 59 1 1 2 1 1 4 1 1 6 1 1 7 1 1 1 1 2 1 1 2 1 2 3 2 4 1 2 6 1 3 3 3 3 3 3 3 3 3 3 3 5 5 5 5 5 5 5 6 6 6 6	0 42 1 52 3 3 4 14 5 23 7 11 7 48 8 16 8 38 8 56 9 13	10 40 10 58 11 22 11 53 0a35 1 31 2 42 4 4 5 30 6 57 8 24 9 49 11 10 0m38 2 2 3 23 4 35 5 34 6 53 7 17 7 36 7 52 8 6 8 19

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			MARCH.							
	D.	D.		5.	BUN				ON.	_
	M.	W.	REMARKABLE EVENTS.		ses. S	-	Ris	es.	Se H.	
-	1	Tu	THE THE PROPERTY WHEN THE THE PARTY WAS AN ADMINISTRATION OF THE PARTY WAS ASSESSED.	6	505	-	11a	371	8	46
	2	W	Dr. Hurter d. 1898	6	48 5		11		9	1
	3.	Th	21. 124.01 (1. 2000	6	465		0 m	-	9	21
	4	F	Poitevin d. 1882 (7.52 M.	6	445	42	0	48	9	48
	5	S	J. Albert b. 1825	6	415	44	1	59	10	24
	6	5	4th Sunday in Lent.	6	395	46	3	8	11	13
1	7	M	J. N. Niepce b. 1765	6	375	48	4	10	0a	17
	8	Tu		6	35 5	49	5	1		33
	9	W	J. B. Reade's process, 1839	6	325		5	43		58
	10	Th		6	305		6	15	4	26
	11	F	●0.12 A.	100				40	5	55
	12	S		6	25 5			59	7	24
	13	5	5th Sunday in Tent.	6	23 5			16	8	52
	14	M	Herschel's process Royal Soc., 1839	6	216			33		20
	15	Tu	Dr. Hurter b. 1844	6	196			51	11	
	16	W	Collodio Chl. G. W. Simpson, 1865	6				11		
	17	Th		6	146			36		12
1	18	F	D 3.37 M.					9	2	29
	19	S	Thomas Sutton d. 1875	6				53		33
1	20	5	Palm Sunday.	6				49	1	
	21	M	T:1.D.C. (1.11077	6				56		57
	22	Tu	Liverpool P.S. founded 1853	6				a 9	_	24
	23	W	B11 1999 0991	5				53		
	25	Th	Becquerel b. 1820 08.21 A		-			37	1 -	13
	26	S		5				49 59		
	27	5	Faster Sundan John D.	- 1 -				23	1 -	
	28	M	Easter Sunday. John Pouncey d				11	17	_	-
-	29	Tu	Bennett's emulsion process, 1878	5				26	1 -	7
	30	W	Denness's emulsion process, 1878	2	446					
1	31	Th		5			11	47		

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See Page 225.

		APRIL.		
D. M.	D. W.	REMARKABLE EVENTS.	SUN. Rises. Sets. H. M. H. M.	MOON. Rises. Sets.
1	F		1	0m56 8m19
2	S		5 37 6 31	2 0 9 2
3	5	Tow Sunday (0.48 M.	5 35 6 33	2 56 9 58
5	M Tu	Rev. J. B. Reade b. 1801	5 32 6 35 5 30 6 36	3 40 11 8 4 14 0a27
6	W	Nev. J. D. Reade 6. 1801	5 28 6 38	4 40 1 51
7	Th	Voigtlander d. 1878	5 26 6 40	5 1 3 19
8	F		5 23 6 41	5 19 4 48
9	·S	[chromate pat. 1858 • 9.25 A.	5 21 6 43	5 36 6 18
10	5	2nd Sunday after Easter [Gum Bi-	5 19 6 45	5 52 7 48
11	M	Willis Aniline process 1865	5 17 6 46 5 15 6 48	6 11 9 19
12	Tu	Steinheil b. 1832	5 15 6 48 5 13 6 50	6 35 10 50 7 5 11 49
14	Th		5 106 52	7 45 0 m 14
15	F		5 86 54	8 39 1 26
16	S	у 2.4 A.	5 66 55	9 44 2 22
17	5	3rd Sunday after Easter		10 57 3 2
18	M	Ponton's Bichromate process, 1839	5 26 58	0a13 3 30
19	Tu	Warren de la Rue d. 1889	5 07 0	1 27 3 52
20	W		4 58 7 2 4 56 7 3	2 39 4 9 3 49 4 23
22	F		4 54 7 5	4 57 4 35
23	S		4 51 7 6	6 6 4 46
24	5	4th Sunday after Easter 01.23 A.	4 49 7 8	7 15 4 58
25	M	Dr. Miethe b. 1862	4 47 7 19	8 25 5 13
26	Tu	Adam Salomon d. 1881	4 45 7 11	9 36 5 30
27	W			10 47 5 51
28 29	Th F			11 54 6 19 0m18 6 57
30	S	Col. Stuart-Wortley d. 1890	4 38 7 18	0 52 7 48



LENSES and APPARATUS are described on

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		MAY.	
D. M.	D. W.	REMARKABLE EVENTS.	BUN. MOON. Rises. Sets Rises. Sets.
-			H. M. H. M. H. M.
1	5	Rogation Sunday.	4 36 7 19 1m39 8m51
2	M	(1.30 A.	4 34 7 21 2 16 10 6
3	Tu		4 33 7 22 2 4 1 11 27
4	W		4 31 7 24 3 5 0a51
5	Th	J. W. Draper b. 1811	4 29 7 26 3 23 2 16
6	F	Humboldt d. 1859	4 27 7 28 3 40 3 43
7	S.	[gher d. 1897	4 25 7 29 3 56 5 11
8	5	Sunday after Ascension P. Mea-	4 23 7 31 4 13 6 42
9	M	●5.33 M.	4 21 7 33 4 33 8 14
10	Tu	S. London Pho. S. formed 1859	4 197 35 5 0 9 45
111	W	R. L. Maddox d. 1902	4 17 7 37 5 36 11 7
12	Th		4 15 7 39 6 24 11 50
13	F	Dr. P. H. Emerson b. 1856	4 13 7 40 7 27 0 m 13
14	S	Fahrenheit b. 1686	
15	5	Whit Sunday Francis Bedford d.	4 10 7 42 9 55 1 34
16	M	Major C. Russell d. 1887 D 2.13 M.	4 97 44 11 14 1 58
17	Tu		4 77 46 0a27 2 16
18	W		4 67 47 1 38 2 31
19	Th		4 57 49 2 47 2 44
20	F		4 37 50 3 56 2 56
21	S	Scheele d. 1776	4 27 51 5 5 3 8
22	5	Grinity Sunday	4 17 52 6 15 3 21
23	M	B. J. Savce d. 1895	4 07 53 7 26 3 36
24	Tu	O 5.39 M.	3 58 7 54 8 37 3 56
25	W	O 0.00 M;	3 57 7 56 9 45 4 22
26	Th	H. B. Berkelev d. 1890	3 56 7 57 10 47 4 57
27	F	21.2. 201.0.0	3 55 7 59 11 38 5 43
28	S		3 54 8 0 0ml 6 42
29	5	1st Sunday after Grinity	3 53 8 1 0 18 7 53
30	M	The second second	3 52 8 2 0 48 9 10
31	Tu	(10.25 A.	0 000 0 10 0 20

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		JUNE.				100			
D. M.	D. W.	REMARKABLE EVENTS.	R H.	SUN ises S M. H	ets.		MC ses. M.	ON. Se	ts.
1	W	Talbot's Patents, 1841	3	528	4	1n	129	11	53
2	Th		3	518	5	1	45	1a	16
3	\mathbf{F}		3	508			1	2	41
4	S	[Platinotype patent, 1873]		498		2	17	4	8
5	5	2nd Sunday after Grinity First		498			34		38
6	M		3	488	_		56		10
7	Tu	● 1.16 A.	3	478			27		38
8	W		3	478		4	9		53
9	Th	Alvan Clark d. 1897 [Society, 1841		468		5			51
10	F	Talbot on Calotype at the Royal		468		6	17		32
11	S		3	468		7	35		50
12	5	3rd Sunday after Grinity.	3	468	14	8	55	0 n	
13	M	[D4.19 A.	3	458		10	12		21
14	Tu	Daguerre received pension, 1839.	3	458		11	25		37
15	W	Bertsch's fixed focus camera, 1860	3	448	17		135		51
16	Th		3	448	18	1	44	1	4
18	F	[1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-	3	448	18	2	53		16
19	8 5	[emulsion marketed, 1874	-	448	19	4	2		29
20	M	4th Sunday after Trinity Kennet		438	20	5	13		43
21	Tu	Waterhauge step inter 1959		43 8 43 8	20	7	25 35	2 :	25
22	W	Waterhouse stop intro., 1858		448	20	8	40		57
23	Th	Sir J. W. Swan's brom. paper pat. E. L. Wilson d. 1903 O 8.12 A.	3	458	19	9	35		39
24	F	Hardwich d. 1890		45 8	19	10	19		35 l
25	S	[b. 1839]		468	19	10	52		44
26	5			468	19	11	17	7	0
27	M			478	19	11	37		20
28	Tu			478		11	53		42
29	W	Ferrous-oxalate Developer pub. 1877		478	18			11	3
30	Th			488	18	0	8	Oa?	- 1
-		[(4.39 M.	3	100	10		0	Vali	

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TARIFF, Page 1228.

		JULY	
D. M.	D. W.	REMARKABLE EVENTS.	BUN. Rises. Sets. H. M. H. M. H. M.
1	F	Copyright Act passed, 1862	3 49 8 18 0m23 1a49
2	S	10 0 1	3 50 8 18 0 39 3 15
3 4	5	6th Sunday after Trinity	3 50 8 17 0 58 4 43
	M		3 51 8 17 1 23 6 10
5	Tu	Nicephore Niepce d. 1833	3 51 8 16 1 59 7 30
6	W	W. J. Stillman d. 1901 9.20 A.	
7	Th		3 53 8 15 3 53 9 26
8	F	C1 10F1	3 54 8 15 5 9 10 0
9	5	[d. 1851	
10	M	7th Sunday after Grinity. Daguerre	0 000 00 10
12	Tu	Second platinotype patent, 1878	3 57 8 12 9 7 10 57 3 58 8 12 10 19 11 10
13	W	Second platinotype patent, 1818	3 598 11 11 30 11 22
14	Th	р 8.24 м.	
15	F	y 0.21 m.	4 18 9 1 4811 49
16	S		4 28 8 2 58 0ml
17	5	8th Sunday after Grinity	4 48 7 4 10 0 8
18	M	Gelatine emulsion first advt. 1873	4 58 6 5 21 0 26
19	Tu	Copyright Union founded 1893	4 68 5 6 28 0 54
20	W	Coll. Pos. Process. pub. 1852	4 78 4 7 27 1 33
21	Th		4 8 8 3 8 16 2 25
22	F	○8.37 M.	
23	S	Louise III to to the Control of the In	
24	5	9th Sunday after Grinity. Major-	
25	M	[Sir William Abney b. 1843	
26	Tu	Niepce de St. Victor b. 1806	4 14 7 56 10 15 8 52 4 15 7 55 10 29 10 15
28	Th		4 15 7 55 10 29 10 15 4 17 7 54 10 45 11 37
29	F	(9.35 M.	1
30	S	(3.35 M.	4 207 52 11 25 2 26
31	5	10th Sunday after Grinity	4 217 50 11 56 3 52

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		AUGUST.								
D	D.	REMARKABLE EVENTS.	R	SUN ises, S			MC es.		ets.	-
M.	W.		H.	м. н	. м.	H. 1	м.	н	. м.	1
1	M		4			0:	m5		a12	1
2	Tu		4	25 7	46	0			23	1
3	W	Mungo Ponton d. 1880	4	27 7	44	1	36			1
4	Th		4	297	42	2	47	7	57	1
5	F	W. K. Burton d. 1899 6.37 M.	4	307	41	4	6	8	24	1
6	S		4	327	39	5	27	8		1
7	5		4	33 7	37	6	46	9	1	1
8	M	Roger Fenton d. 1869. Ed. Valenta	4	347	35	8	1	9	15	1
9	Tu		4	367	33	9	13	9	28	-
10	W	W. H. Harrison d. 1897	4	37 7	32	10	24	9	41	-
11	Th		4	397	30	11	33	9	54	1
12	F		4	417	28		133		9	1
13	S		4	437	26		54		27	1
14	5	12th Sunday after Grinity Da-	4	45 7	24	3		10	52	
15	M	[guerre's Eng. pat. 1839]		467	22	4	15		26	1
16	Tu	Lavoisier b. 1743	4	477	20	5	18		56	1
17	W		4	497	18	6			12	-
18	Th		4	517	16	6	52		12	1
19	F	the state of the s	4	527	14	7	22		25	
20	S	Daguerreotype pub. 1839 07.14A.	4	547	12	7	47		46	-
21	5	13th Sunday after Grinity. Chevreul	4	55 7	10	8	5		10	1
22	M	[b. 1786	4	577	8	8	21	6	35	
23	Tu		4	58 7	6	8	36	8	0	-
24	W	Scott-Archer collodion pat. 1855	5	07	4	8	51	9	24	1
25	Th	Faraday d. 1867	5	27	2	9		10	49	1
26	F		5	37	0	9	28		115	-
27	S	(2.33 A.	5	56	58	9	55		41	1
28	5	14th Sunday after Grinity.	5	6.6	56	10	33	2	3	1
29	M		5	86	53	11	25	4	16	1
30	Tu	Oliver Sarony d. 1879	5	96	51	11	55	5	14	1
31	W		5	116	49	0m	131	5	57	1

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:			SEPTEMBER	
i	70	D		SUN. MON.
	D. M.	D. W.	RE IARKABLE EVENTS.	Rises. Sets. Rises. Sets.
				H. M. H. M. H. M. H. M.
·	1	Th		5 13 6 47 1m47 6 a 27 5 14 6 44 3 7 6 50
	2	F	●6.6 A.	5 16 6 42 4 26 7 7
	3	S	_	5 17 6 40 5 42 7 21
	4	5	15th Sunday after Grinity	5 19 6 38 6 56 7 34
	5	M	W. B. Woodbury d. 1885	5 21 6 35 8 8 7 46
	6	Tu	Poitevin Mem. inaug., 1885	5 22 6 33 9 18 7 59
	8	Th	Pollevin Meni. maug., 1803	5 24 5 31 10 29 8 13
	9	F	Colbro. Proc. pub. 1864	5 25 6 29 11 40 8 30
	10	S	Cot510. 1 foc. pub. 100 i	5 27 6 26 0a51 8 52
	11	5	16th Sunday after Grinity. D 8.11 A.	5 29 5 24 2 0 9 21
	12	M	toth Zunoug upter Orthogr polizzin	5 31 6 22 3 5 10 0
	13	Tu		5 32 6 19 4 010 54
	14	W		5 34 6 17 4 48 11 50
	15	Th		5 35 6 15 5 23 0 ml
	16	F	Panoramic lens (Sutton) p. 1861	5 37 6 13 5 49 1 18
	17	S	Fox Talbot d. 1877 [cault b. 1819	5 38 6 10 6 9 2 41
	18	5	17th Sunday after Grinity. Leon Fou-	
	19	M	T. Grubb d. 1878 04.52 M.	5 41 6 5 6 41 5 34
1	20	Tu	Talbot Dis. Devel. 1840	5 42 6 3 6 56 7 1
	21	W	Stas b. 1813	5 44 6 1 7 12 8 29
	22	Th		5 46 5 59 7 32 9 57
	23	F	Woodburytype pat. 1864	5 48 5 56 7 57 11 26
	24	S	[Monckhoven b. 1834, d. 1882	
	25	5	18th Sunday after Grinity. Dr. Van	
-	26	M	[(5.48 M.	5 53 5 49 10 22 3 13
1	27	Tu		5 54 5 47 11 35 4 0

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5 59 5 42 2 11 5 15

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D. M.	D. W.	REMARKABLE EVENTS.	Ri	SUN. ses. Sets.		ON. Sets.
-	***		H.		H. M.	н. м.
1	S		6	1 5 38		5a29
2	5	19th Sunday after Grinity	6	35 36		5 42
3	M	●8.32 M.	6	45 33		5 54
4	Tu		6	5 5 31	7 4	6 5
5	W	Louis Lumière b. 1864	6	75 29		6 18
6	Th		6	9 5 27	9 25	6 34
7	F	Leon Warnerke d. 1900	6	11 5 25		6 54
8	S		6	13 5 22		7 20
9	5	20th Sunday after Grinity	6	14 5 20	0a55	7 55
10	M		6	15 5 18		8 42
11	Tu	D 1.40 A.	6	17 5 15		9 42
12	W		6	19 5 13		10 53
13	Th		6	21 5 11		11 30
14	F	J. J. Elliot b. 1835	6	22 5 9		0 m22
15	S		6	24 5 7		1 36
16	5	21st Sunday after Grinity	6	26 5 5		3 1
17	M	Dr. Neuhaus b. 1855	6	28 5 2		4 27
18	Tu	Wheatstone d. 1875 0 2.24 A.	6	30 5 0		5 55
19	W	Aug. Lumière b. 1862	6	31 4 58		7 26
20	Th		6	33 4 56		8 58
21	F	·	6	35 4 54		10 30
22	S		6	36 4 52		11 56
23	5	22nd Sunday after Grinity	6	38 4 50		1 a 8
24	M		6	40 4 48	9 23	2 1
25	Tu	Vernon Heath d. 1895 (5.48 M.	6	42 4 46	1	2 38
26	W		6	43 4 44	11 35	3 4
27	Th		6	45 4 42		3 23
28	F	Colchlo. of Silver Process pub. 1864	6	47 4 40		3 38
29	S	Talbot Photo-eng. Process pat. 1852	6	49 4 38	1	3 51
30	5	23rd Sunday after Trinity	6	51 4 37		4 3
31	M		8	52 4 35	4 52	4 14

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-	NOVEMBER.							
	D. M.	D. W.	REMARKABLE EVENTS.			ets.	MOCRISES.	ON. Sets. H. M.
	1	Tu		6	5414	34	6m3	
1	2	W	●1.56 M.	6	56 4	31	7 14	4 40
	3	Th		6	574	29		
	4	F	Statue to Daguerre at Bry, 1852	6	59 4	27	9 36	
1	5	S		7	14		10 45	5 53
	6	5		7	34	24		
-	7	M	Col. C. G. H. Kinnear d. 1894	7	54	22	0a40	
-	8	Tu		7	64	21	1 21	8 36
1	9	W	J. Traill Taylor d. 1895	7	84	19		
ı	10	Th	Orthochromatism, Vogel, 1873	7	104	17		
1	11	F	[р 5.29 м.	7	124	15		
1	12	S	Sir H. Trueman Wood b. 1845	7	144	14		0m31
1	13	5	25th Sunday after Trinity	7	154	12	3 5	
1	15	M		7	194	11	3 19	
-	16	W		7	21 4	10	3 35	
	17	Th	○0.25 M.	7	24 4	6		7 54
1	18	F	Daguerre b. 1787	7	26 4	5		
	19	S	[nett's Pellicle pat. 1873]	7	27 4	4	5 54	
1	20	5	26th Sunday after Grinity [Ken-		294	3		11 53
1	21	M	zory zanoug after oranic [Hon-	7	31 4	1	8 23	
	22	Tu	Schlippe b. 1749	7	324	0	9 45	1 8
	23	W	Harrison (Inv. of Globe Lens) d. 1864	7	34.3	59		1 29
1	24	Th	[(6.13 A.		363		11 55	
	25	F		7	373		0m20	
	26	S	framic Camera pat. 1859	7		56		2 12
-	27	5	Advent Sunday. Sutton's Pano-			55		2 22
	28	M		7	423	55	3 52	2 34
	29	Tu		7	433	54	5 2	2 48
-	30	W	- 4 - 7 - 1 - 1	7	443	54	6 14	3 5

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D. M.	D. W.	REMARKABLE EVENTS.	Ri			MO Rises.	ON. Sets.	
			н.		- '	H. M.	н. м.	
1	Th	Carl Zeiss d. 1888 9.11A.		45 3		7m26	3a26	
2	F		7	463	52	8 36	3 54	
3	S		7	473	52	9 41	4 33	
4	5		7	493	51	10 38	5 24	
5	M	Obernetter's chromophoto pat. 1864		503	51	11 22	6 26	
6	Tu	·	7	513	50	11 55	7 37	
7	W		7	523	50	0a20	8 54	
8	Th		7	533	49		10 13	
9	F	D 7.5A.	7	543	49	0 56	11 33	
10	S	[Brewster b. 1781	7	553	49	1 10	0 m5	
11	5	3rd Sunday in Advent Sir D.	7	563	48	1 23	0 54	
12	M	Rev. J. B. Reade d. 1870	7	573	47	1 38	2 17	
13	Tu	Poitevin's Ph-e. p. 1855	7	583	47		3 44	
14	W		7	593	46		5 14	
15	Th		8	03	46		6 47	
16	F		8	13	46	1	8 16	
17	S		8	23	46		9 31	
18	5	4th Sunday in Advent	8	33	45			
19	M	Dr. H. W. Vogel d. 1898	8	43	45			
20	Tu		8	53	44	8 44		
21	W		8	63	43		11 51	
22	Th	Wollaston d. 1828	8	63	43	11 19	0 a 6	
23	F	(10.36 M.	8	73	44	11 57	0 19	
24	S	(10.55 M.	8	73	45		0 31	
25	5	Christmas Day Sir I. Newton b. 1642	8	83	46		0 42	
26	M		8	83	48		0 55	
27	Tu		8	83	49		1 11	
28	W	J. T. Goddard d. 1866	8	83	50	5 14	1 31	
29	Th	v. 1. Goddard d. 1000	8	83	52	6 25	1 56	
30	F	J. H. Dallmeyer d. 1883	8	83	54			
31	S		_					
DI	1 0	A. Braun 1877 • 4.21 A	Ö	83	54	8 31	3 17	

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The following list of British Photographic Societies has been compiled from data supplied by their respective Secretaries, except where so indicated. In these instances no information has been received up to the time of going to press.

* Societies marked with an asterisk are affiliated to the Royal

Photographic Society.

* The Royal Photographic Society of Great Britain. FOUNDED 1853.

Patrons.—His Majesty the King; Her Majesty the Queen.

Vice-Patrons,-H.R.H. the Prince of Wales: H.R.H. the Princess of Wales.

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Annual Exhibition .- September to October, at the New Gallery, 121, Regent Street, London, W. Secretary.—J. McIntosh, 35, Russell Square, London.

- Aberdeen Photo. Art Club.—Pres., G. L. Smith. Meetings, 62, Fonthill Road, Alternate Fridays from October 1. Sec., John Rae, 19, St. Nicholas Street, Aberdeen.
- Aberdeen Photographic Association. Pres., Alfred J. Wood. Meetings, 154, Union Street, Fridays, 8 p.m. Sec., Andrew Gray, 18, South Mount Street, Aberdeen.
- Accrington Camera Club.—Pres., Councillor John Clegg Lupton.

 Meetings, Mechanics' Institute, Alternate Mondays, from October
 4, 8 p.m. Sec., John Threlfall, 19, Monk Street, Accrington.
- Acton Photographic Society.—Pres., C. B. Green. Meetings, Churchfield Hall, Second and Fourth Wednesdays, 8 p.m. Sec., A. W. Scott Cowan, "Annandale," Buxton Gardens, Acton, London, W.
- Airdrie (Monklands), N.B. Particulars not received from Secretary.
- *Aldershot and District Camera Club.—Pres., General Sir Geo. Marshall, K.C.B. Meetings, The Institute, Second and Fourth Tuesdays, October to May. Sec., David Morrison, 80, St. Michael's Road, Aldershot.
- Altrincham Photographic Society.—Pres., T. R. Foxcroft.

 Meetings, 7, Market Street, Alternate Tuesdays, from October 7.

 Sec., E. J. Middleton-Guimaraes, Stancliffe, Cavendish Road,
 Bowdon, Cheshire.
- Arbroath Amateur Photographic Society.—Pres., Geo. G. Dalgarno. Meetings, Y.M.C.A. Rooms. Sec., James Hood, 94, High Street.
- Architectural Association Camera and Sketching Club.—
 Pres., Alan Potter. Meetings, 18, Tufton Street, Westminster,
 Third Thursdays. Sec., A. D. Robinson, 18, Tufton Street,
 Westminster, London, S.W.
- Armley and Wortley Photographic Society.—Pres., Dr. T. H. Waddington. Meetings, Station Road Mission Room, Armley. Alternate Thursdays, from October 7. Sec., George E. Craven, 1, Paisley View, Upper Armley, Leeds.
- Artists R.V. (20th Middlesex).—Pres., Colonel W. Horsley.

 Meetings, Duke's Road, Euston Road, Frequently during winter.

 Sec., Henry W. Fairholme, Blenheim Mansions, Queen Anne's
 Gate, London, S.W.
- Ashton-under-Lyne Photographic Society.—Pres., John W. Kenworthy. Meetings, The Rooms, Henry Square, Fridays. Sec., Wm. Hallam, 43, Taunton Road, Ashton-under-Lyne.
- Aston Photographic Society.—Pres., Harold Baker. Meetings, Burlington Hall, High Street, Thursdays, 8 p.m. Sec., F. Greenway, 43, Douglas Road, Handsworth, Birmingham.
- Attercliffe Photographic Society.—Pres., L. Havenhand.

 Meetings, Friends' Meeting House, Leeds Road, Sheffield.

 First and Third Mondays, 8 p.m. Sec., Herbert H. Diver, 439,

 Middlewood Road, Sheffield.

- Ayr Amateur Photographic Society.—Pres., Robert Adam.

 Meetings, 48, High Street, Mondays, 8 p.m..

 Sec., Robert Weir, 21, Ardlui Road, Ayr, N.B.
- *Balham Camera Club.—Pres., W. W. Aldridge. Meetings, 141, Balham Hill, Wednesdays, 8.30 p.m. Sec., F. Beard, 4, Chetwode Road, Trinity Road, London, S.W.
- Banbury and District Photographic Society.—Meetings, Municipal Technical School, First Mondays, 8 p.m. Sec., Seymour H. Beale, Caerleon, Banbury.
- Barrhead and District Amateur Art Club.—Pres., R. Murray, Meetings, Studio, Water Road, Wednesdays, 8 p.m. Ex., April. Sec., J. McGrouther, Glenartney, Barrhead.
- Barrow Naturalists' Field Club (Photographic Section).—Pres., W. J. Angus. Meetings, Cambridge Hall, St. George's Square, Tuesdays, 8.15. Sec., James Frankland, 8, Greengate, Barrowin-Furness.
- *Bath Photographic Society.—Pres., Rev. Jas. Dunn, M.A. Meetings, Royal Literary and Scientific Institution, alternate Mondays, from October 4. Sec., W. J. Hallett, 10, Stall Street, Bath.
- Batley and District Photographic Society.—Pres., Dr. Broughton. Meetings, Technical School, Thursdays, 8 p.m. Sec., Charles Henry Giggal, 38, Wellington Street, Batley.
- *Bedford Camera Club.—Pres., R. W. L. Phillips. Meetings, Association Buildings, Alternate Mondays, from October 3, 8 p.m. Ex., March. Sec., Ernest F. Buttfield, 95, Tavistock Street, Bedford.
- *Belfast City Y.M.C.A. Camera Club.—Pres., A. G. Cromie.

 Meetings, Y.M.C.A., Wellington Place, First Tuesdays. Sec.,
 Hugh Crawford, Kinvara, Castle Park, Belfast.
- Belfast Queen's University Camera Club.—Pres. John Wylie, B.A. Meetings, Students' Union, Queen's University, First Tuesdays. Sec., J. D. M. M'Callum, Ardenwohr, Windsor Avenue, Belfast.
- *Belmont Camera Club.—Pres., Charles Radburn. Meetings, Sherwood House, York Road, Battersea, S.W. Sec., P. A. Belcher, Belmont Works, Battersea, London, S.W.
- Bideford Camera Club.—Pres., J. Whitlock. Meetings, Bridge Chambers, Fridays, 8 p.m. Sec., J. H. Alford, 3, Trafalgar Place, Bideford.
- *Birkenhead Photographic Association.—Pres., R. J. Russell.

 Meeting*, Y.M.C.A., Grange Road, Fridays, 8 p.m. Sec., J. T.

 Peters, 62, Westbourne Road, Birkenhead.
- *Birmingham Photographic Society.—Pres., Harold Holcroft, M.A., F.C.S., F.R.P.S. Meetings, Exchange Buildings, New Street, Tuesdays, 7.30. Ex., February. Sec., S. Wortley, 10, Newhall Street, Birmingham.

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- Birmingham Field Naturalists' Club.—Pres., A. H. Angus, B.Sc. Meetings, People's Hall, Tuesdays, 7.30 p.m. Sec., Herbert Thompson, 68, Castleford Road, Sparkhill, Birmingham.
- Birstall Photographic Society.—Pres., Albert Capstick. Meetings, Parish Church Institute, Alternate Thursdays, from September 30. Sec., William Blakeley, Chemist, Market Place, Bir: tall, near Leeds.
- *Bishop Auckland Photographic Society.—Pres., W. Loftus Cummins. Meetings, 11, Silver Street. Ex., November. Sec., Geo. Ross, Cemetery Lodge, Bishop Auckland.
- Blackburn and District Camera Club.—Pres., Dr. J. Barr, J.P. Meetings, 29, Church Street, Second Tuesdays. Sec., W. Ernest Balme, 95, Queen's Road, Blackburn.
- Blackburn Inter-Club Photographic Alliance,—Pres., W. Baldwin. Meetings, Shorrock Fold. Sec., Arthur Clayton, 10 Wycollar Road, Blackburn.
- Blackpool and Fylde Photographic Society.—Pres., John R. Johnson Meetings, 1, Clifton Street, Tuesdays, September to April, 8 p.m. Sec., A. F. Wilson, 34, Woodland Grove, Blackpool.
- Blairgowrie and District Photographic Association.—Pres., Alexander Geekie. Meetings, Club Rooms, George Street, Third Tuesdays (except during June, July, and August), 8.15 p.m. Sec., Lake Falconer, jun., The Alders, Rattray, Blairgowrie.
- Blaydon and District Camera Club.—Particulars not received from Secretary.
- Bletchingley and Nutfield Camera Club.—Pres., Rev. A. H. De Fontaine. Meetings, Church House. Sec., Jarvis Kenrick, Pendell House, B'etchingley.
- Blyth and District Camera Club.—Pres., Lord Ridley. Meetings, Wright Street, Cowpen Quay, Alternate Tuesdays, from October 19. Sec., W. French, 20, Barnard Street, Blyth.
- Bolton Camera Club.—Pres., W. M. Balshaw. Meetings, Corporation Chambers, Corporation Street, Thursdays, 8 p.m. Sec., H. Lightouler, 26, Mackenzie Street, Astley Bridge, Bolton.
- Bolton Photographic Society.—Sec., C. K. Dalton, 50, Higher Bridge Street, Bolton,
- Bonnybridge Amateur Photographic Association. Particulars not received from Secretary.
- Bootle, Johnson Bros. Photographic Society.—Pres., B. S. Johnson. Meetings, Recreation grounds, first Mondays. Sec., A. Currie, 6, Corona Road, Waterloo, Liverpool.
- Bootle Photographic Society.—Pres., Alderman W. R. Brewster, J.P. Meetings, Central Public Library, Tuesdays, 8 p.m. Sec., W. E. Parry, 3, Church Street, Bootle, Lancs.
- *Borough Polytechnic Photographic Society.—Pres., E. H. Roberts. Meetings, 103, Borough Road, Wednesdays, 8.15 p.m. Sec., Alfred G. Buckham, 103, Borough Road, London, S.E.

- Boston Camera Club.—Prev., Dr. C. W. Pilcher. Meetings, St. James's Schools, George Street, First and Third Tuesdays, October to April, 8.30 p.m. Sec., H. M. Hames, 65, West Street, Boston, Lincolnshire.
- Bournville and District Photographic Society.—Pres., George Shann, M.A. Meetings, Ruskin Hall, Mondays 8 p.m. Sec., A. Harris, 96, Oak Tree Lane, Selly Oak, near Birmingham.
- *Bournville Camera Club.—Pres., George Cadbury, jun. Meetings, Bournville Works Social Club, Second and Fourth Thursdays, 7 p.m. Sec., J. Oliver Wilkes, 303, Franklin Road, King's Norton, near Birmingham.
- *Bowes Park and District Photographic Society.—Pres., E. H. Down. Meetings, Unity Hall, Newnham Road, Wood Green, N., First and Third Mondays, 8 p.m. Sec., H. Taylor Smith, 19, Meads Road, Westbury Avenue, Wood Green, London, N.
- Bradford Photographic Society.—Pres., A. Bracewell. Meetings, Arts Club, Mondays, 8 p.m. Sec., W. E. Townend, 14, Manchester Road, Bradford.
- Bradford Grammar School Photographic Society.—Pres., Rev. W. H. Keeling, M.A. Meetings, Bradford Grammar School, Tuesdays, 7.30 p.m. Sec., Harold Atkinson, 275, Rock Terrace, Bradford.
- Braintree and Bocking Camera Club.—Meetings, The Institute. Sec., Edward Fenton, High Street, Braintree.
- Brechin Photographic Association.—Pres., Wm. Shaw Adamson. Meetings, Mechanics' Institute. Third Wednesdays, 8.15 p.m. Sec., D. M. Watt, 5, Union Street, Brechin, N.B.
- *Brentford Photographic Society. Particulars not received from Secretary.
- Brighouse Photographic Society Pres., Dr. Geo. A. Farrer. Meetings, Studio, Town Hall Buildings, Thursdays, 8 p.m. Sec., F. W. Crowther, Woodleigh, 13, Old Lane, Brighouse.
- *Bristol and West of England Amateur Photographic Association.—Pres., Frank Richardson. Meetings, 20, Berkeley Square, Clifton, Second and Fourth Fridays, October to April. Sec., Guy Chilton, 34, Baldwin Street, Bristol.
- *Bristol Photographic Club.—Pres., John Fisher. Meetings, Stuckey's Restaurant, Wine Street. Second and Fourth Wednesdays, 8 p.m. Sec., Thomas C. Pearse, 38, Queen's Square, Bristol.
- *Bromley (Kent) Camera Club.—Pres., J. Scott, B.A., M.B. Meetings, The Literary Institute, Widmore Road, First and Third Fridays, from October to April, 8 p.m., Ex., January. Sec., Thos. D. Graty, Collingtree, Cambridge Road, Bromley, Kent.
- Broomfield (Golcar) Photographic Society.—Pres., Councillor Henry Wilkinson. Meetings, Broomfield House, Golcar, First Weduesdays. Sec., Harold Rawcliffe, 24, Carr Lane, Slaithwaite, near Huddersfield.

- *Burnley Camera Club.—Pres., T. Judson. Meetings, Mechanics' Institution, Thursdays, 7.45 p.m. Sec., Charles B. Anderson, Hood House Grove, Burnley.
- Burnley Co-operative Camera Club. Meetings, Committee Room, Co-operative Society, Tuesdays. Sec., J. Spencer, 138, Cleaver Street, Burnley, Lancs.
- Burton-on-Trent Natural History and Archæological Society (Photographic Section). Particulars not received from Secretary.
- Bury Athenæum Photographic Society.—Pres., Dr. A. P. Nuttall. Meetings, Athenæum, Market Street, Alternate Fridays, October to April. Sec., J. Nichols, 36, Nelson Street, Fishpool, Bury, Lanes.
- *Bury St. Edmund's Camera Club.—Pres., J. D. Hunter. Meetings, Masonic Hall. Sec., Owen A. Clark, 12, Abbeygate Street, Bury St. Edmund's.
- *Cambridge and District Photographic Club.—Pres., W. H. Bansall. Meetings, Hobson's Place, Sidney Street, Second and Fourth Tuesdays, 8.30 p.m. Ex., November. Sec., T. J. Sowdon, "Sunny Side," Guest Road, Cambridge.
- Canterbury Camera Club.—Pres., Dr. R. Graham Wills. Meetings, Gaywood's Restaurant, Alternate Mondays, from October 4, 8.30 p.m. Sec., G. T. Hobbis, 3, Norman Road, Canterbury.
- Cardiff City Y.M.C.A. Camera Club.—Particulars not received from Secretary.
- *Cardiff Photographic Society.—Particulars not received from Secretary.
- Cardiff Windsor Photographic Society.—Pres., W. Holloway. Meetings, 6, High Street, Thursdays, 8 p.m. Sec., I. Vaughan Evans, 149. Richmond Road, Cardiff.
- Carluke Photographic Association.—Pres., Richard Chalmers.

 Meetings, Clyde Street, Second Mondays, 8 p.m. Sec., Andrew
 Fraser, Auchencairn, Home Street, Carluke.
- *Carlisle and County Amateur Photographic Society.—Pres., John Sewell. Meetings, Tullie House, Wednesdays, 8 p.m. Sec., Samuel W. B. Jack, Grosvenor Studios, 19, Lowther Street, Carlisle.
- Carlisle Liberal Border City Camera Club.—Pres., F. W. Chance. Meetings, Liberal Club, Lowther Street, First and Third Tuesdays, November to March. Sec., John Robinson, 37, Warwick Road, Carlisle.
- Carnoustie Photographic Association.—Pres., D. J. Henderson, Meetings, Club Rooms, Terrace Road, Second and Fourth Mondays. Sec., Harry Methyen, Panmure Bank, Carnoustie.
- Caterham Camera Club.—Meetings, Caterham Institute, Second and Fourth Mondays, 8.30 p.m. Sec., J. C. Scrivener, "Mistleigh," Caterham Valley.

- *Catford and Forest Hill Photographic Society.—Pres., Major E. F. Coates, M.P. Meetings, Dartmouth Hall, Forest Hill, First and Third Mondays. Ex., March. Sec., William Theyer Browne, 169, Woolstone Road, Forest Hill, S.E.
- Central Photographic Society.—Pres., Dr. J. H. Wilson. Meetings, Central Y.M.C.A., 346, Strand, W.C. Ex., October. Sec., John W. Hobday, Central Y.M.C.A., 346, Strand, London, W.C.
- *Central Technical College Photographic Society.—Pres., Prof. O. Henrici, F.R.S. Meetings, Central Technical College, Wednesdays during winter. Sec., E. E. Walker, 210, Bedford Hill, Balham, London, S.W.
- Century Camera Club.—Pres., Professor Finlay. Sec., J. B. Philip, 8, Belvidere Crescent, Aberdeen.
- *Chelmsford Photographic Society.—Pres., The Mayor. Meetings, School of Art, First and Third Thursdays, 8 p.m. Sec., W. J. Morison, Savernake Lodge, Chelmsford.
- *Chelsea and District Photographic Society.—Pres., F. Humpherson. Meetings, South-Western Polytechnic, Manresa Road, Chelsea, Alternate Thursdays, from October 14. Sec., R. C. Gibbs, 169A, Fulham Road, London, S.W.
- Cheltenham Amateur Photographic Society.—Pres., Sir E. Templer Leeds, Bart. Meetings, York House, St. Luke's Road, Alternate Wednesdays from September 15, 8 p.m. Sec., Walter J. Bache, "Eythorne," All Saints' Road, Cheltenham.
- *Cheltenham College Photographic Society.—Pres., C. E. Youngman, M.A. Meetings, College Physics Lecture Room. Sec., R. M. Towers, M.A., 7, Oriel Place, Cheltenham.
- Cheltenham-Salem Institute Camera Club.—Pres., E. J. Burrow. Meetings, Salem Institute, Cheltenham, Last Thursdays. Sec., J. Ashton Mann, Southampton House, London Road, Cheltenham.
- *Chester Society of Natural Science, Literature, and Art (Photographic Section).—Pres., J. A. McMichael, B.A., B.Sc. Meetings, Grosvenor Museum, Third Fridays, 8 p.m. Sec., Frank Simpson, 10, Grosvenor Street, Chester.
- Chester Y.M.C.A. Camera Club.—Pres., T. C. Johnson. Meetings, Parr's Bank Chambers, First Thursdays. Sec., Albert E. Matthews, 5, Parkgate Road, Chester.
- Chichester Photographic Society.—Pres., F. B. Tompkins, Meetings, Technical Institute, Second and Fourth Tuesdays, October to March, 8.15; Second Thursdays, April to September. Sec., Ernest H. Hooper, 26, South Street, Chichester.
- *Chislehurst Photographic Society.—Pres., Rev. James Dawson, M.A. Meetings, Society's Rooms, Crown Lane, alternate Mondays October to May. Sec., George W. Miller, White House, The Common, Chislehurst.
- *Chiswick Camera Club.—Pres., C. H. Marriott. Meetings, Devonshire Room, Town Hall, Second and Fourth Tuesdays at 8.15. Sec., William H. Cook, 45, Boston Park Road, Brentford.

- Chorley Photographic Society.—Pres., Richard Gill. Meetings, Library Street, Second Wednesdays, 7.30 p.m. Sec., John Rawlinson, 41, Hamilton Road, Chorley.
- City Guilds Technical College Photographic Society.—Dead.
- *City of London and Cripplegate Photographic Society.— Pres., Chairman of the Cripplegate Foundation. Meetings, Cripplegate Institute, Second and Fourth Mondays, 7.30 p.m. Ex., February. Sec., H. S. Cuming, 234, North End Road, West Kensington, London, W.
- Clapham Carlton Camera Club. Pres., Major Frank Johnson.

 Meetings, Clapham Carlton Club. Sec., Herbert Tozer, Preston
 House, Clapham Common, S.W.
- Cleveland Camera Club.—Pres., J. J. Burton. Meetings, Literary and Philosophical Institution, Corporation Road, Middlesbrough, Alternate Mondays. from October 11, 7.30 p.m. Sec., Fred. W. Pearson, 39, Granville Road, Middlesbrough.
- *Coalville and District Photographic Society.—Pres., A. H. Harris. Meetings, Adult School, Bridge Road, Third Thursdays, 8 p.m. Sec., Owen W. F. Thomas, "Glencoe," London Road, Coalville.
- Coatbridge Co-operative Camera Club.—Pres., William Lawson.

 Meetings, Library Hall, alternate Mondays, from October 4. Sec.,
 George P. Frame, jun., 28, Portland Street, Coatbridge, N.B.
- Coatbridge Natura!ists' Association (Photographic Section).

 —Pres., S. H. Wood. Meetings, Carnegie Library, First and Third Thu sdays, October to April. Sec., Geo. Watson Campbell, Ailsa Cottage, Coatbridge.
- Coatbridge Photographic Association.—Pres., S. H. Wood, Meetings, Carnegie Library, Second and Fourth Thursdays from October 28. Ex., October. Sec., William McAnsh, 216, Bank Street, Coatbridge.
- Colne Camera Club.—Pres., Joseph Hey. Meetings, Cloth Hall, Walton Street, Fridays. Sec., Joseph H. Kay, 167, Skipton Road, Colne, Lancs.
- Consett and District Photographic Society.—Pres., E. J. George. Meetings, Luton House, Middle Street, Wednesdays and Saturdays, 8 p.m. Sec., W. E. Massey, 28, Constance Street, Consett.
- *Cornish Camera Club.—Pres., R. Pearce Couch. Meetings. The Studio, Penzance. Sec., Henry Stewart, 6, Causewayhead, Penzance.
- Cornwall Royal Polytechnic Society.—Pres., John D. Enys.

 Meetings, Polytechnic Hall, Falmouth. Ex., September. Sec.,
 E. W. Newton, 4, Cross Street, Camborne, Cornwall.
- *Coventry Photographic Club.—Pres., M. W. Danks. Meetings, 7, Little Park Street, Wednesdays. Ex., March. Sec., J. B. Stanley, 7, Little Park Street Coventry.

- *Cowes Camera Club.—Pres., Rev. R. G. Davis. Meetings, Town. Hall. Second and Fourth Wednesdays, from October to March Sec., Edwin E. Vincent, 4, High Street, Cowes, I.W.
- Cowlairs Co-operative Camera Club.—Pres., Robert J. Habbick.

 Meetings, 264, Springburn Road, Glasgow, Second and Last Fridays.

 Ex., March. Sec., S. J. Moreland, 264, Springburn Road, Glasgow.
- Crompton Camera Club.—Pres., James H. Broadbelt. Meetings, Club House, Collinge Street, Shaw, Wednesdays. Sec., Henry Illingworth, Holmdene, Chamber Road, Shaw, Lancs.
- *Croydon Camera Club.—Pres., J. M. Sellors. Meevings, 128A, George Street, Wednesdays, 8 p.m. Sec., W. H. Claypole, B.A., 63, Elmwood Road, West Croydon, Surrey.
- Culcheth Camera Club.—Pres., M. H. Kenyon. Meetings, Sunday Schoolroom, Newton Heath, Third Mondays. Sec., Henry Barratt, 14, Hope Street, Newton Heath, Manchester.
- Darlington Camera Club.—Pres., H. Pike Pease, J.P. Meetings,
 Temperance Institute, Alternate Tuesdays, from October 5. Sec.,
 Charles J. Barthorpe, Northgate, Darlington.
- Darwen Photographic Association.—Pres., J. W. Smith. Meetings, Belgrave Schools, Wednesdays, 8 p.m. Sec., William Edge, 11, Cobden Street, Darwen, Lancs.
- Deal and Walmer Camera Club.—Dead.
- Dennistoun Amateur Photographic Association.—Pres.
 Charles S. Bathgate. Meetings, 53, Roslea Drive, Wednesdays,
 8 p.m. Ex., February. Sec., A. M. Logan, Lesterie, Riddrie,
 Glasgow.
- *Derby Photographic Society.—Pres., C. J. Cade. Meetings Cumberland's Room, The Wardwick, Second Mondays. Sec., Norman Baker, The Hollies, Littleover, Derby.
- *Derby School Field Club.—Pres., Rev. A. C. Knight. Meetings, Derby School. Sec., The Secretary, Derby School, Derby.
- Devonport Camera Club.—Pres., C. Dietschey. Meetings, Technical Schools, Second Tuesdays. Sec., S. F. Heal, Holmleigh, Alma Road, Plymouth.
- Dewsbury Photographic Society.—Pres., Albert Lyles. Meetings, Central Liberal Club. Bond Street, Mondays, October to March inclusive, 8 p.m. Sec., Joseph Garside, 45, Heald's Road, Dewsbury.
- *Doncaster Camera Club.—Pres., W. Roberts. Meetings, The "Albany." Second and Fourth Tuesdays from September 28, 8.15 p.m. Ex., November. Sec., Fred A. Jordan, 21, Baxter Gate, Doncaster.
- Dorking Camera Club.—Pres, Wm. J. Down. Meetings, Literary Institute, First Thursdays, 12.15 p.m, Sec., B. F. Piper, 72, High Street, Dorking,

- *Dover Institute Photographic Society. Pres., E. M. Worsfold. Meetings, Dover Institute, Second and Fourth Thursdays. Sec., H. E. Philpott, 6, Biggin Street, Dover.
- *Dover Sciences Society.—Pres., Captain S. G. McDakin.

 Meetings, "Arthur's Room," First and Third Tuesdays, 8 p.m.

 Sec., A. W. Gilham, Holmesdale, Priory Hill, Dover.
- Droylsden Co-operative Photographic Society.—Pres., N. Hibbert. Meetings Central Premises, Market Street, First and Third Thursdays, 8 p.m. Sec., J. Fellows, 53, Montana Street, Openshaw, Manchester.
- Dudley and District Camera Club.—Pres., Dr. John Wishart, Meetings, Council Schools. Sec., James Martin Sankey, Loraine House, Dudley, Northumberland.
- Dukinfield Photographic Society.—Pres., S. T. Ainsworth.

 Meetings, Co-operative Hall, Astley Street, Wednesdays, 8.30.

 Sec., Ernest Till, 30, Bass Street, Dukinfield.
- Dumbarton Equitable Co-operative Camera Club.—Pres., Wm. Craig. Meetings, 46, High Street, Alternate Tuesdays, 7.30 p.m., from October 5. Sec., George Watson, 216, High Street, Dumbarton.
- *Dundee and East of Scotland Photographic Association.— Pres., J. A. Peebles.—Meetings, University College, First Thursdays, November to May (except January). Sec., V. C. Baird, Broughty Ferry.
- *Ealing Photographic Society.—Pres., J. Watson, F.R.P.S. Meetings, Town Hall, First and Third Wednesdays, October to March. Sec., T. W. Bartlett, 20, Craven Avenue, Ealing.
- Earlestown, Newton, and District Photographic Society.—

 Pres., George M. McAinsh. Meetings, Town Hall, Earlestown,
 Last Thursdays, 8 p.m. Sec., Ernest P. Cleworth, 19, Cross Lane,
 Newton-le-Willows.
- *Eastbourne Natural History, Scientific and Literary Society (Photographic Section).—Pres., J. J. Hollway. Meetings, Technical Institute, Third Thursdays, October to May, 8.15 p.m. Sec., Albert J. Fellows, 7, Susans Road, Eastbourne.
- *East Kent Scientific and Photographic Society.—Pres., S. Harvey, F.I.C., F.C.S. Meetings, Beaney Institute, alternate Wednesdays, 8 p.m. Sec., A. Lander, 17, High Street, Canterbury.
- *Edinburgh Photographic Society. Pres., J. F. Duthie, F.R.P.S. Meetings, 38, Castle Street, First, Second, and Fourth Wednesdays, October to June. Ex., February. Sec., J. S. McCulloch, W.S., 3A, North Saint David Street, Edinburgh.
- Edinburgh Heriot Camera Club.—Pres., T. A. Clark. Meetings, George Heriot's School. Sec., D. J. R. Cairns, 12, W. Savile Terrace, Edinburgh.
- Edinburgh Photographic Club.—Pres., J. F. Duthie. Meetings, 38, Castle Street, Third Wednesdays, 8 p.m. Sec., T. Barclay, 26, Blackford Avenue, Edinburgh.

- Edinburgh University Photographic Society.—Particulars not received from Secretary.
- *Epsom and District Literary and Scientific Society (Photographic Section).—Pres., Dr. E. C. Daniel. Meetings, Committee Room, Public Hall. Sec., W. J. Pickering, Waterloo Road, Epsom.
- Erdington Photographic Society. Pres., G. L. Moore, Meetings, Drayton Studio, High Street, every Monday September to March, 8 p.m., last Monday in month April to August. Sec., Thomas A. Sands, 26, Hillaries Road, Gravelly Hill, Birmingham.
- Everton Camera Club.—Pres., J. Colefield. Meetings, 14, Village Street, Wednesdays, 8 p.m. Sec., J. P. Gee, 30, Douglas Road, Anfield, Liverpool.
- *Exeter Camera Club.—Pres., T. A. Goard. Meetings, Barnfield House. Alternate Mondays, October to May. Sec., J. W. Lake, 41, High Street, Exeter.
- *Fakenham Literary and Camera Club. Pres., Algernon Digby, M.A. Meetings, Lecture Hall. Sec., Henry Newson, The Square, Fakenham, Norfolk.
- *Folkestone and District Camera Club.—Pres., Alderman F. Hall, J.P. Meetings, Technical Schools, First and Third Thursdays. Sec., Geo. H. Sheaff, Priory Dene, Julian Road, Folkestone.
- *Forest Gate Camera Club. Pres., Rev. J. H. French. Meetings, Richmond Hall, Romford Road, Tuesdays, 8 p.m. Sec., Edw. J. May, 6, Tylney Road, Forest Gate, London, E.
- Glasgow and West of Scotland Amateur Photographic Association.—Pres., Victor L. Alexander. Meetings, 180, West Regent Street, First and Third Mondays. Ex., February. Sec., James McKissack, 68, West Regent Street, Glasgow.
- Glasgow Eastern Photographic Association.—Pres., Thomas B. Kirkhope. Meetings, 12A, Landressy Street, Thursdays, 8 p.m. Sec., William Silvie, 48, Greenvale Street, Mile End, Glasgow,
- Glasgow Southern Photographic Association.—Pres., Robert Ure, B.Sc. Meetings, 169, Eglinton Street, Tuesdays, 8 p.m. Ex., March. Sec., Robert Lindsay, 191, Allison Street, Govanhill, Glasgow.
- Glasgow St. George Co-operative Camera Club.—Pres., J. Rennie. Meetings, 40, Gladstone Street, Glasgow, alternate Fridays, from October 1. Ex., December. Sec., J. Pettigrew, 8, Buchanan Street, Partick, Glasgow, W.
- Glenalmond Photographic Club.—Pres., Arthur S. Reid, M.A., F.G.S. Meetings, Trinity College, Alternate Saturdays during College Terms. Sec., A. S. Reid, Trinity College, Glenalmond, Perthshire.
- Glossop Dale Photographic Society.—Pres., J. Merry. Meetings, Metcalf's Rooms, High Street, First Tuesdays. Sec., T. W. Sharpe, 85, Primrose Terrace, Glossop.

- *Gloucestershire Photographic Society.—Particulars not received from Secretary.
- Godalming Photographic Society.—Meetings, Municipal Buildings, Last Thursdays, October to March, 8.15 p.m. Sec., S. R. Verstage, Holloway Hill, Godalming.
- Grange Photographic Club.—Pres., John F. Haws. Meetings, 27, Trafford Chambers, St. John Street, Liverpool, Third Saturdays. Sec., A. E. Wallis, 27, Trafford Chambers, St. John St., Liverpool.
- Grange-over-Sands Literary and Scientific Society (Photographic Section).—Pres., G. A. Booth. Meetings, Victoria Room, Mondays, 7.30 p.m. Sec., Rev. Geo. Vicars-Gaskell, Grange-over-Sands.
- Grangemouth Amateur Photographic Association.—Pres., Joseph McGowan, M.D. Meetings, Lumley Street, Second Thursdays, 8 p.m. Sec., Robert Marshall, 3, Park Terrace, Grangemouth.
- *Grantham Photographic Society. Pres., Thomas Stow. Meetings, Museum, Guildhall. First and Third Tuesdays. Sec., J. M. Smith, 31, High Street, Grantham.
- Graphic Society, Plymouth.—Pres., G. F. Treleaven. Sec., J. S. Hawker, Mutley House, Plymouth.
- **Gravesend and District Photographic Society.**—Particulars not received from Secretary.
- *Great Western Railway Literary Society (Photographic Section).—Pres., Col. the Hon. C. E. Edgeumbe. Meetings, 44, Eistbourne Terrace, Paddington, W., every Third Tuesday from October 5, 5.45 p.m. Ex., March. Sec., C. E. Smith, 44, Eastbourne Terrace, Paddington, London, W.
- Greenock Camera Club.—Pres., Colonel W. U. Park. Meetings, Good Templar Hall, Thursdays, 8 p.m., from September to April. Sec., Robert MacNaught, 70, Union Street, Greenock.
- Grimbsy and District Camera Club. Pres., A. H. Hewitt Meetings, 160, Freeman Street, First Wednesdays. Secs., W. H. Scrimshaw, 92, Lambert Road, Grimsby, and Alfred Still, 27, Pasture Street, Grimsby.
- *Guernsey Photographic Society.—Pres., Col. T. W. M. de Guérin. Meetings, Guille-Allés Library, First Mondays (winter months), 8 p.m. Sec., H. C. Le Messurier, Old Bank, Guernsey.
- Guild, (The) Leeds.—Sec., R. Stockdale, 13, Mount Preston, Leeds.
- *Guildford Photographic Society.—Particulars not received from Secretary.
- Guisborough Fine Art and Industrial Society—Pres., W. Charlton, J.P. Meetings, Mechanics' Institute. Sec., George Page, 34, Westgate, Guisborough.
- Guiseley and District Photographic Society.—Deal.

- *Guy's Hospital Nurses' Photographic Society.—Pres., Miss S. A. Swift. Meetings, Nurses' Home, Guy's Hospital, Weekly, Sec., Miss M. Smith, Guy's Hospital, S.E.
- *Hackney Photographic Society.—Pres., J. Linley. Meetings, Hackney Baths, Tuesdays, 8 p.m. Ex., November. Sec., Walter Selfe, 24, Pembury Road, Ciapton, London, N.E.
- Halifax Camera Club.—Pres., J. Ingham-Learoyd. Meetings, 29, Northgate, Tuesdays, October to March inclusive. Sec., Harry Crossley, 10, Surrey Street, Hopwood Lane, Halifax.
- Hamilton Photographic Society.—Pres., James Ellis. Meetings, Free Library. Sec., William Frame, Windmill Road, Hamilton.
- *Hampstead Scientilic Society (Photographic Section).—

 Meetings, Stanfield House, Prince Arthur Road. Sec, H. Nevil
 Smart, 40, Compayne Gardens, Hampstead, London, N.W.
- *Handsworth Photographic Society.—Pres., Philip Whitehouse-Meetings, 20, Soho Road, Thursdays, 8 p.m. Sec., A. E. Teague, 67, Whitehall Road, Handsworth, Birmingham.
- Hanley Y.M.C.A. Photographic Society.—Pres., S. Harrison. Meetings, Y.M.C.A. Rooms, Tuesdays, October to March, 7.30 p.m. Secs., J. R. Cox, 217, Cubridge Road, Hanley, and George T. Boulton, 125, Gilman Street, Hanley.
- Harthill Camera Club. Pres., Dr. Millar. Meetings, Studio, Bankhead, Alternate Wednesdays from September 15th. Sec., William Martin, Victoria Place, Harthill, Lanarkshire, N.B.
- *Hartlepools Photographic Society.—Pres., F. Yeoman, J.P. Meetings, Technical College, West Hartlepool, First and Third Wednesdays. Sec., A. S. Foxall, 1, Elm Grove, West Hartlepool.
- *Hastings and St. Leonards Photographic Society.—Pres., R. White-Ford, J.P. Meetings, Public Hall, First Thursdays and Third Mondays, 8.15 p.m. Sec., J. Turner, "Southlands," 57, Priory Avenue, Hastings.
- Havant Camera Club.—Pres., E. Trevett. Meetings, The Pavilion, Third Thursdays. Ex., October. Sec., J. L. Riley, 24, West Street, Havant, Hants.
- Heaton and District Camera Club (Newcastle-on-Tyne).—

 Pres., Samuel Orr. Meetings, Byker Bridge Assembly Rooms,
 First and Third Thursdays from October 7. Sec., George C. Urwin,
 24, Tenth Avenue, Newcastle-on-Tyne.
- Hebden Bridge Photographic Society.—Pres., J. H. Bamford, Meetings, Secondary School, Pitt Street, Second Tuesdays and Saturdays. Sec., Robert Law, 29, Melbourne Street, Hebden Bridge.
- Herefordshire Photographic Society. Pres., Walter Pilley. Meetings, 76, Eign Street. Sec., Frank C. Pritchard, High Town, Hereford.
- Horwich Mechanics' Institute Photographic Society.—Pres., George Hughes. Meetings, Mechanic's Institute, First and Third Wednesdays, 7.30 p.m. Ex., March. Sec., W. Cunningham, 31, Penn Street, Horwich.

- *Hove Camera Club.—Pres., A. R. Sargeant, J.P. Meetings, 9, Lansdowne Street, Second and Fourth Tuesdays. 8 p.m. Ex., October. Sec., Stanley Read, 12, Old Steine, Brighton.
- Huddersfield Naturalist and Photographic Society:—Pres., Owen Avison. Meetings. Technical College, Alternate Wednesdays, from October 6. Sec., A. C. Ellis, "Braeside," Huddersfield.
- Hull Photographic Society.—Pres., Dr. John Divine. Meetings, Grey Street, Thursdays, 8 p.m. Sec., F. J. Webster, 96, Witham, Hull.
- *Ibis Camera Club.—Pres., Sir Henry Harben. Meetings, 142, Holborn Bars. Secs., W. H. Coleman, Battlefield Road, St. Albans, and H. A. Costello, 142, Holborn Bars, E.C.
- Idlers' Camera Club. Pres., Roderick J. Fry. Meetings, 45, Nevil Road, Bristol, last Saturdays. Sc., George C. D. Mallett, 45, Nevil Road, Bristol.
- *Hford Photographic Society.—Pres., F. C. Boyes. Meetings, Cecil Hall, Wednesdays, 8 p.m. Ex., February. Sec., T. M. Weaver, 69, Elgin Road, Seven Kings, Hford, Essex.
- Ilkeston Arts Club.—Pres., The Mayor. Meetings, Free Library, First Fridays. Ex., April Sec., Arthur Smith, Cleeve Villa, Graham Street, Ilkeston.
- Ipswich Camera Club.—Pret., G. H. Hewetson. Secs., R. Dixey, Waterloo House, Ipswich, and S. Haggar, 111, London Road, Ipswich.
- *Ipswich Scientific Society (Photographic Section).—Pres., Frank Woolnough. Meetings, The Museum, First Wednesdays, 8 p.m. Sec., H. De Beer, 93, London Road, Ipswich.
- *Ipswich Social Settlement Camera Club.—Pres., Sir Daniel F. Goddard, M.P. Meetings, Social Settlement, Fore Street, alternate Mondays from January 3. Sec., Fredk. G. Mallett, "Montgomery," Bishops Hill, Ipswich.
- *Isle of Man Camera Club.—Pres., W. Beck. Meetings, 61, Buck's-Road, Douglas, alternate Tuesdays, 8 p.m. Sec., T. B. Qualtrugh, 76, Buck's Road, Douglas, Isle of Man.
- *Isle of Wight Photographic Society.—Pres., Prof. J. Milne, F.R.S., D.Sc. Meetings, Literary Institute, Newport, First and Third Wednesdays October to March, First Wednesday April to September. Sec., Harold Read, 80, The Mall, Newport, I.W.
- Jarrow Mechanics' Institute Camera Club.—Pres., E. W. Penman. Meetings, Mechanics' Institute, Alternate Thursdays, from October 14, 8 p.m. Sec., J. D. Wake, 35, Wansbeck Street, Jarrow-on-Tyne.
- Keighley Photographic Society.—Pres., Thos. Mountain. Meetings, Mechanics' Institute, Tuesdays. Sec., Wilfrid Moore, "Hazelroyd," Keighley.
- Kennaway Photographic Society.—Pres., the Rev. Prebendary H. E. Fox. Meetings, 16, Salisbury Square, E.C., Last Mondays. Sec., W. R. C. Cooke, C.M. House, 16, Salisbury Square, London, E.C.

Kettering Photographic Society.—Pres., J. A. Gotch, F.S.A.

Meetings, Church Institute, Second Thursdays, 8 p.m. Sec.,

Ernest Claypole, 112, Hawthorn Road, Kettering.

Kidderminster and District Photographic Society.—Pres.,
J. Armytage Batley, M.A. Meetings, rear of 21, High Street,
October to April, alternate Mondays, 8 p.m., from October 11.
Summer Session, Fourth Mondays. Sec., H. W. West, The
Hollies, Birmingham Road, Kidderminster.

King's Heath and Moseley Photographic Society. — Particulars not received from Secretary.

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King's Lynn Photographic Society.—Pres., S. A. Gurney. Sec., W. E. Daw, Hazeidene, Hunstanton.

- *Kingston-on-Thames and District Photographic Society.

 —Pres., John F. East, J.P. Meetings, Public Library, Mondays,
 October to March, 8 p.m. Secs., John F. East, J.P., Uxbridge
 House, Kingston-on-Thames, and A. W. Grant, Woodleigh,
 Crane's Park Avenue, Surbiton.
- *King William's College, Isle of Man, Photographic Society.—Pres., J. D. Paul. Meetings, Engineering Laboratory, King William's College. Sec., Eric D. Lismey, King William's College, Isle of Man.
- Kinning Park Co-operative Camera Club. Pres., George Peebles. Meetings, Club Rooms, 6, Langlands Road, Govan, alternate Tuesdays, from January 4, 8 p.m. Sec., Hugh Topping, 20, Elizabeth Street, Ibrox, N.B.

Kirkcaldy Photographic Society.—Pres., A. B. Young. Meetings, 196, High Street, First Mondays. Ex., March. Sec., James

M. Harcus, 28, Townsend Place, Kirkcaldy.

Lancaster Photographic Society.—Pres., Thos. Baines. Meetings, Stonewell, Mondays and Fridays, 8 p.m. Ex., November. Sec.; R. T. Simpson, 60, North Road, Lancaster.

Larkhall Camera Club.—Pres., Patrick Gallacher. Meetings, Club Rooms, First and Third Fridays. Sec., Robert Rodger, 37, Claude

Street, Larkhall.

Leeds Camera Club.—Pres., R. Bourke. Meetings, Leeds Institute, Cookridge Street, Mondays, 8 p.m. Sec., F. G. Issott, 33, Dorset Terrace, Harehills, Leeds.

Leeds Photographic Society.—Pres., Thomas W. Thornton.

Meetings, Leeds Institute, Cookridge Street, Tuesdays, 8 p.m.

Sec., Robert Mackay, 69, Albion Street, Leeds.

Leeds Central Technical School (Photographic Laboratory).

Meetings, Central Technical School, Tuesdays and Thursdays,
7.15 p.m. Sec., James Graham, Education Offices, Leeds.

Leek Photographic Society.—Pres., Victor Prince. Meetings, Alexandra Club, Market Place, Mondays and Thursdays, 8 p.m.

Sec., H. Mottershead, 41, St. Edward Street, Leek.

Leicester and Leicestershire Photographic Society.—Pres., A. Bailey. Meetings, Oriental Café, Market Place, Leicester, Wednesdays, 8 p.m. Sec., Chas. Wm. Leake, 2A, Dulverton Road, Leicester,

- Leicester Literary and Philosophical Society (Section "G," Photography),—Pres., W. Bell. Meetings, Council Chamber, Town Museum, First Thursdays, October to April. Sec., W. Bailey, 6, Welford Road, Leicester.
- Leigh (Lancs.) Photographic Society.—Pres., T. Lee Syms, F.R.P.S. Meetings, over Co-operative premises, Railway Road, alternate Thursdays from October 7, 8.30 p.m. Sec., J. W. Markham, 59, Windermere Road, Leigh, Lancs.
- Leith Amateur Photographic Association.—Pres., Thos. Wilson. Meetings, 6, Charlotte Street, Last Tuesdays. Sec., Robert Knowles, 45, Pitt Street, Leith, N.B.
- Lewes Photographic Society.—Pres., G. J. Wightman. Meetings, Town Hall, Second Tuesdays, 8 p.m. Sec., F. W. Davey, Moat Cottage, St. Michaels, Lewes.
- Lincoln Amateur Photographic Society.—Pres., J. T. Coleman. Meetings, Guild Court, Dane's Terrace, Fridays, 8 p.m. Sec., W. Otter, 87, Ripon Street, Lincoln.
- Lindley Naturalist and Photographic Society.—Pres., Charles Mosley. Meetings, Mechanics' Hall, Alternate Mondays from October 18, 8 p.m. Sec., George Henry Kaye, 66, Rock Terrace, West Street, Lindley, near Huddersfield.
- *Liverpool Amateur Photographic Association.—Pres., J. Dudley Johnston. Meetings, 9, Eberle Street, Thursdays, 7.45 p.m. Sec., Chas. F. Inston, F.R.P.S., 25, South John Street, Liverpool.
- Liverpool Central Y.M.C.A. Camera Club.—Pres., F. O. Creswell. Meetings, Y.M.C.A., Mount Pleasant. Sec., J. Graham, 26, Alfred Road, Birkenhead.
- *London and County Bank Photographic Club Pres., J. J. Cater. Meetings, Sports Club, Norbury, Third Saturdays, October to April. Sec., H. G. Hart, 21, Lombard Street, London, E.C.
- *London and Provincial Photographic Association.—Trustees, T. E. Freshwater, A. Haddon. Meetings, Apple Tree and Mitre, Cursitor Street, E.C., Thursdays, 7.30 p.m. Sec., Ernest Human, 43, Whitta Road, Manor Park, Essex.
- *London County Council Camera Club.—Pres., A. H. Verstage.

 Meetings, County Hall, Spring Gardens, S.W., Fourth Thursdays,
 5.30 p.m. Sec., H. Clutterbuck, County Hall, Spring Gardens,
 London, S.W.
- Londonderry Camera Club.—Pres., Sir R. Newman Chambers, Kt. Meetings, 12, Strand Road, First Wednesdays. Sec., R. W. Saville, 61, Beechwood Avenue, Londonderry.
- Longridge Camera Club.—Pres., Rev. R. Walker Berry.

 Meetings, Chapel Street, Tuesdays. Sec., J. Robinson, College
 Villas, Longridge, near Preston.
- Longton and District Photographic Society.—Pres., Dr. A. Parkes, J.P. Meetings, Sutherland Institute, Second and Fourth Thursdays, S-ptember to April, 7.30 p.m. Sec., Thomas Mottershead, 32, Stafford Street Longton, Staffs.
- *Lyonsdown Amateur Photographic Society.—Particulars not received from Secretary.

- Loughborough and District Photographic Society.—Pres., Walter C. Burder, J.P. Meetings, The Club, Biggin Street, Fridays, 8 p.m. Ex., March. Sec., J. E. Underwood, Bedford Square, Loughborough.
- *Maidstone and Institute Camera Club.—Pres., Rev. A. Gatehouse. Meetings, Church Institute, Second and Fourth Thursdays from September 30. Sec., J. C. Harris, 23, Knightrider Street. Maidstone.
- *Malvern Camera Club.—Pres., Sir Henry Foley Grey, Bart.

 Meetings, Camera Club, Priory Place, First and Third Mondays.

 Sec., J. Bate Nickolls, F.C.S., The Exchange, Malvern.
- *Manchester Amateur Photographic Society.—Pres., Dr. A. T. Lakin. Meetings, Ducie Chambers, 57, Market Street, Tuesdays, 6 p.m. Sec., George M. Morris, 9, Chandos Road, Chorlton-cum-Hardy, Manchester.
- Manchester Camera Club.—Sec., Charles Dawson, 34, Queen Street, Manchester.
- Manchester Photographic Society.—Pres., Thomas Chilton.

 Meetings, Exeter Restaurant, Second Mondays, September to
 May, 7.30 p.m. Sec., C. H. Coote, Holly Bank, Ashton-onMersey, Manchester.
- Manchester—Simpson Memorial Camera Club.—Pres., Dr. A. T. Lakin. Meetings, Simpson Memorial, First and Third Fridays, 8 p.m. Sec., W. H. Tyas, Oak Bank, Blackley, Manchester.
- Manchester V.M.C.A. Photographic Club.—Pres., H. Burr.

 Meetings, Y.M.C.A., 56, Peter Street, First Fridays. Sec., T.

 Cox, 43, Monton Street, Moss Side, Manchester.
- Mansfield Camera Club.—Pres, F. W. Ellis. Sec., W. O. Pegg, 44, Westfield Lane, Mansfield.
- *Margate Photographic and Scientific fociety.—Pres., John Stokes. Meetings, St. John's House, Hawley Square, Wednesdays. Sec., John Saxby, 23. Upper Approach Road, Margate.
- *Marylebone Camera Club. Pres., Jordan Roche Lynch, junr. Meetings, Presbyterian Church, Upper George Street, Second and Fourth Mondays. Sec., E. Markwell, 38, Upper George Street, Edgware Road, London, W.
- Melbourne Camera Club.—Dead.
- Mid-Cheshire Society of Art.—Sec., George Holland, 32, Moss Road, Northwich.
- Midlothian Photographic Association.—Pres., J. B. Johnston. Meetings, 5, St. Andrew Square, Edinburgh, First and Third Thursdays, October to May, 8 p.m. Ex., February. S2c., G. W. Black, 123, George Street, Edinburgh.
- Mill Camera Club. Pres., E. H. Joynson. Meetings, The Laboratory, Joynson's Paper Mills, St. Mary Cray, Fridays, 8 p.m. Sec., W. C. Swindon, River Cottage, St. Paul's Cray, Kent.
- Millfields Road (Clapton) L.C.C. School Photographic Society.—Dead.

- Morley and District Photographic Society.—Pres., Dr. S. T. Steele. Meetings, Queen Street, First and Third Tuesdays. Sec., Ernest B. Bradley, Worrall Street, Morley, Yorks.
- Morpeth Y.M.C.A. Camera Club.—Pres., Alderman G. B. Bainbridge. Meetings, Y.M.C.A., Mondays, 7.30 p.m. Ex., April. Sec., James Whittle, 30, Bridge Street, Morpeth.
- Motherwell Young Men's Institute Camera Club.—Particulars not received from Secretary.
- Muirkirk Amateur Photographic Association.—Pres., Rev. James Greenshields, B.D. Meetings, Irondale, Tuesdays, 8 p.m. Sec., William Barrowman, Irondale, Muirkirk.
- Neath and District Photographic Society.—Pres., Herbert S. Sutton. Meetings, Y.M.C.A. Lecture Hall, Tuesdays, 8 p.m. Sec., George H. Weekes, 5, Lewis Road, Neath.
- *Nelson Camera Club. Pres., A. Smith. Meetings, Co-operative Buildings, Elizabeth Street, Tuesdays, 7.45. Sec., Fred Hartley, 4. Pickup Street, Nelson, Lancs.
- *Nelson Photographic Society.—Pres., A. E. Normington, M.B. Meetings, Victoria Hall, Scotland Road, Tuesdays, 7.30 p.m. Sec., Henry H. Beetham, 98, Brunswick Street, Nelson, Lancashire.
- New Mills and District Camera Club.—Pres., Heibert Wyatt.

 Meetings, 13, Union Road, Thursdays. Sec., John Bradbury,
 Sunny Bank, Furness Vale, Stockport.
- Night Photographers, Society of.—Pres., A. H. Blake, M.A. Sec., Russell Burchall, L.C.C. County Hall, Spring Gardens, London, S.W.
- *Northampton Natural History Society and Field Club (Photographic Section).—Pres., H. Manfield, M.P. Meetings, 63, Abington Street: Sec., C. H. Dorman, A.R.I.B.A., 53, Abington Street, Northampton.
- North London Photographic Society.—Pres., G. Hale. Meetings, 7, Highbury Place, Thursday, 8.15 p.m. Ex., February. Sec., H. E. Jackson, 11, The Broadway, Highbury Park, London, N.
- *North Middlesex Photographic Society. Pres., H. W. Fincham. Meetings, Hanley Hall, Sparsholt Road, Crouch Hill, Wednesdays, 8.15 p.m. Sec., Chas. A. Morgan, 23, Nelson Road, Stroud Green, London, N.
- *North-West London Photographic Society.—Pres., Walter Kilbey. Meetings, Spencer Hall, 19, Dartmouth Park Hill, N.W. Second and Fourth Thursdays, October to May. Ex., May. Sec., Henry S. Date, 3A, Woodsome Road, Highgate Road, London, N.W.
- *Norwich and District Photographic Society.—Pres., A. E. Coe.

 Meetings, Castle Museum and Municipal Secondary School, First
 and Third Mondays, 8 p.m. Ex., February. Sec., J. T. Tanner,
 The Lodge, Bowthorpe Road, Norwich.
- *Nottingham Camera Club.—Pres., Arthur Marshall, F.R.P.S. Meetings, Mechanics' Institution, Thursdays, 8 p.m. E'x., March. Sec., E. A. Pollard, 4, Hedley Villas, Beach Avenue, Nottingham.

- Oldham Equitable Photographic Society.—Pres., Wm. Mann. Meetings, Equitable Co-operative Society, Greenwood Street, Mondays, 7.30 p.m. Sec., Chas. Ledger, 6, Airey Street, Oldham.
- Oldham Lyceum Photographic Society.—Pres., T. R. Marsden, J.P. Meetings, The Lyceum, Tuesdays, 8 p.m. Sec., Edward Hearne, 99, Manchester Street, Oldham, Lancs.
- Oldham Photographic Society.—Pres., Joseph Dixon. Meetings, Trust Buildings, Manchester Street, Thursdays, 8 p.m. Sec., Harold Embleton, 20, Greengate Street, Oldham.
- Oliver Goldsmith Photographic Society.—Pres., A. H. Butterworth. Meetings, Collyer Hall Schools, High Street, Peckham, S.E., Third Fridays April to September, First and Third Fridays October to March. Sec., H. E. Edmeads, 77, Andell Road, Peckham, London, S.E.
- Otley and District Camera and Art Society.—Pres., Fairfax Fearnley. Meetings, 3, Wesley Street, Tuesdays (October to March), 7.45 p.m. Sec., J. W. Stancliffe, 36, Market Place, Otley.
- Outer Hebrides Photographic Society.—Pres., Archibald A. Chisholm. Meetings, Lochmaddy. Sec., Archibald A. Chisholm, Lochmaddy, Scotland.
- *Oxford Camera Club.—Pres., Sir W. J. Herschel, Bart. Meetings, The University Museum, Second and Fourth Mondays, October to April. Secs., Miss Venables, 26, Norham Gardens, Oxford, and Miss Aitchison, 104, Banbury Road, Oxford.
- Padiham Photographic Society.—Pres., E. Garner. Meetings, Technical School, Alternate Tuesdays, from October 5. Sec., J. Hoole, 1. Moor Lane, Padiham.
- Paisley Pailosophical Institution (Photographic Section).—
 Pres., Dr. Andrew Richmond. Meetings, 28, Oakshaw Street,
 Fridays. Ex., February. Sec., S. Bernard Wade, 11, Buchanan
 Terrace, Paisley, N.B.
- *Peterborough Photographic Society.—Pres., George Kirkwood, M.D. Meetings, Church Institute, Fortnightly. Sec., T. J. Calcutt, 46, Narrow Street.
- *Photographic Club.—Meetings, Red Cross Hotel, Paternoster Square, E.C., Wednesdays, 8 p.m. Sec., A. Corbett, 2, Orchard Street, Portman Square, London, W.
- *Photographic Society of Ireland.—Pres., Robert Benson.

 Meetings, 35, Molesworth Street, Dublin, First and Third Fridays,

 8 p.m. Sec., D. H. Leonard, 24, Cabra Park, Dublin.
- *Plymouth Photographic Society.—Pres., Norton M. Carey.

 Meetings, The Athenæum, Alternate Fridays, 8 p.m. Sec., C. F.

 Ford, 149, Union Street, Plymouth.
- *Polytechnic Photographic Society.—Pres., Howard Farmer. Meetings, 309, Regent Street, Thursdays, 8 p.m. Sec., W. Howard Musson, 309, Regent Street, London, W.
- *Portsmouth Camera Club.—Pres., A. B. Casey. Meetings, 5, Pembroke Road, Wednesdays, October to March, 8.30 p.m. Ex., October. Sec., James C. Thompson, 23, Elm Grove, Southsea.

- Preston Camera C:ub. Pres., J. Tou'mia. Meetings, Stauley Chambers, Lancaster Road, Mondays and Thursdays, 8 p.m. Secs., Charles Mantell, Claremont, Powis Road, Preston, and J. B. Beardsworth, Fairmount, Cadley, Preston.
- *Preston Scientific Society (Photographic Section).-Particulars not received from Secretary.
- Preston (Lune Street), Brotherhood Camera Club.-Pres., Rev. John Wilson, B.A. Meetings, Vestry behind Lecture Hall, Fox Street, Wednesdays, 7.30. Sec., C. E. Peel, Chapel Lane, Longton, near Preston.
- Preston Pictorial Photographic Society.-Pres., G. A. Booth Meetings, 137, Friargate, Fridays. Sec., A. W. Cooper, 137. Friargate, Preston.
- Queen's Park Amateur Photographic Association.—Pres. James McKissack. Meetings, 43, Bankhall Street, Govanhill, Third Thursdays, 7.30 p.m. Sec., John Moir, 318, Allison Street, Govanhill, Glasgow.
- *Ramsgate Photographic Society.—Pres., Leonard G. H. dgson.
 Meetings, St. George's Men's Club, Alternate Mondays from
- October 11. Sec., T. B. White, 12, Harbour Street, Ramsgate.
 Reading Liberal Club Photographic Society.—Particulars not received from Secretary.
- Redcar and Cotham Literary Institute Photographic Society. - Particulars not received from Secretary.
- *Redhill and District Camera Club.-Pres., E. E Robinson. Meetings, 24, Station Road, Second and Fourth Mondays. Ex., November. Sec., C. Robinson, Broadfield, Reigate.
- *Richmond Camera Club .- Pres., F. P. Cembrano. Meetings, Castle Assembly Rooms, Thursdays, 8.30 p.m., October to April. Sec., J. Sargent, 80, Sheen Park, Richmond, Surrey.
- Rochdale Amateur Photographic Society.—Pres., J. Renshaw.

 Meetings, 244A, Yorkshire Street, Wednesdays, 7.45 p.m. Ex.,

 November. Sec., A. E. Cooper, 36, Infirmary Drive, Rochdale.
- Rodley, Farsley, Calverley and Bramley District Photographic Society.—Pres., Walter Trickett. Meetings, alternately at Rodley, Farsley, Calverley, and Bramley, Alternate Thursdays, 8 p.m. Sec., H. Crossley, Rodley, near Leeds.
- Romsey Photographic Society.—Dead.
 *Rotherham Photographic Society.—Pres., C. H. Moss.

 Meetings, Society's Room, Frederick Street, First and Third
 Tuesdays, 8 p.m. Ex., October. Sec., Henry C. Hemingway, Tooker Road, Rotherham.
- Royal Cornwall Polytechnic Society.—Particulars not received from Secretary.
- *Rugby Photographic Society.—Pres., B. B. Dickinson, M.A. Meetings, Physical Lecture Room, Rugby School, Alternate Thursdays, October to April. 8 p.m. Sec., R. H. Myers, 13, Bridget Street, Rugby.
- Ryde Photographic Society.-Pres., M. Maybrick. Meetings, Church Lane, First and Third Tuesdays, 8.30 p.m. Sec., Hugh Edgton, Pier Street, Ryde, Isle of Wight.

St. Albans Camera Club.—Pres., W. S. Green. Meetings, County Museum, Hatfield Road, Third Tuesdays, 8.15 p.m. Secs., Rev. J. Aldred, Berrystead, St. Albans, and Dr. Puddicombe, 19, London Road, St. Albans.

St. Helens Camera Club.—Pres., H. Waizbom. Meetings, 32, Church Street, Tuesdays, 8 p.m. Sec., John Glover, 14, Ormskirk

Street, St. Helens.

St. Rollox Co-operative Camera Club.—Particulars not received from Secretary.

Sale Photographic Society. -Pres., E. Johnson. Meetings, Temperance Institute, Wednesdays, 8 p.m. Sec., J. Pilkington, 137, Marsland Road, Brooklands, Sale.

Salisbury Camera Club.-Pres., Ambrose Tucker. Meetings, School of Art. Ex., March. Sec., H. S. Painter, "Altdorf,"

Bouverie Avenue, Salisbury.

Scarborough and District Photographic Society.—Pres., E. L. Davis. Meetings, Museum, Mondays, 8 p.m., November to March. Sec., B. A. Kenny, 30, Aberdeen Walk, Scarborough.

Shaw Church Institute Photographic and Art Society.—Pres., J. R. Healow. Meetings, Shaw Church Institute, First Fridays. Sec., John Maiden, 93, Rochdale Road, Shaw, near Oldham, Lancs.

*Sheffield Photographic Society.—Pres., J. W. Wright. Meetings, Builders' Exchange, Cross Burgess Street, First and Third Tuesdays, 7.30 p.m. Ex., April. Sec., H. Merrill, 22, Harboard Road, Norton Woodseats, Sheffield.

*Sheffield and Hallamshire Photographic Society.—Pres., C. D. Rose. Meetings, Foresters' Hall, Trippett Lane, Sheffield, Second Wednesdays, 8 p.m. Sec., Fred Lowe, 41, Carrington

Road. Sheffield.

Sheffield Friends' Photographic Society. — Pres., F. R. Pickering. Meetings, Friends' Schools, Hartshead, First and Third Wednesdays, 8 p.m. Sec., John Varley, 238, Stanniforth Road. Attercliffe.

Shettleston and District Camera Club.-Pres., J. Wands. Meetings, 367. Westmuir Street, Parkhead, Second Mondays, 8 p.m. Sec., Adam D. Wilson, 399, Wellshot Rd., Tollcross, Glasgow.

Shotts Camera Club.-Pres., A. W. Hill, J.P. Meetings, Strathfillan Place, First Mondays October to April. Sec., Bert. L.

Forrest, Calderside House, Shotts, N.B.

Shropshire Camera Club.-Pres., Right Hon. the Earl of Plymouth. Meetings, Castle Chambers, Castle Street, Shrewsbury, First Tuesdays, 7.30 p.m. Sec., W. O. Wilding, 33, Castle Street, Shrewsbury.

*Sidcup Camera Club. - Pres., B. Davidson. Meetings, Public Hall, Second and Fourth Tuesdays. Sec., H. E. Ladbury, 7,

Clarence Road, Sidcup.

Skipton Photographic Society.—Pres., James Dodgson. Meetings. Science and Art Schools, Mondays and Fridays. Sec., Percy

Smith, 3, Brougham Street, Skipton.

Small Heath Photographic Society.-Pres., Chas. F. Hayward. Meetings, Council Schools, Somerville Road, Alternate Thursdays from October 7. Sec., Alfred Roffey, 586, Coventry Road, Birmingham.

*Slough Photographic Society.—Particulars not received from Secretary.

Southall-Norwood Camera Club .- Pres., J. Hughes. Meetings, Public Library, Southall, Second and Fourth Tuesdays, 8 p.m. Sec., W. McWilliam, 2, Portland Road, Southall, Middlesex.
*Southampton Camera Club.—Pres, W. Burrough-Hill. Meetings,

Philharmonic Hall, all Mondays from September to March inclusive, and the other six months alternate Mondays. Ex, November. Sec., S. G. Kimber, F.R.P.S., "Oakdene," Highfield, Southampton.

South Devon Teachers' Camera Club.-Pres., A. W. Searley. Meetings, First Saturdays. Sec., Charles Mole, Broadhempston,

Totnes.

*Southend-on-Sea Photographic Society.-Pres., The Mayor. Meetings, Technical School, First and Third Thursdays, October to May. Ex., March. Sec., John Archer, 24, Ashburnham Road, Southend-on-Sea.

*South Essex Camera Club.-Pres., T. H. B. Scott. Meetings, Wakefield Hall, East Ham, Second and Fourth Wednesdays, 8 p.m. Sec., Thomas Michell, 180, Browning Road, Manor

Park, E.

*South London Photographic Society.—Pres., F. J. Mortimer, F.R.P.S. Meetings, South London Art Gallery, Peckham. Mondays, 8 p.m. Ex., March. Sec., H. C. Beckett, 44, Edith Road, Peckham, London, S.E.

South Manchester Photographic Society. - Particulars not

received from Secretary.

South Norwood Photographic Society.-Pres., John Smith. Meetings, Public Hall, Station Road, Thursdays, 8 p.m. Sec., George Richard Beckett, 52, Denmark Road, South Norwood.

Southport Photographic Society.-Pres., John McLellan. Meetings, 9, Corporation Street, Mondays, 8 p.m. Ex., December. Sec., Albert E. Sharples, Dinorwie Road, Birkdale, Southport.

South Shields Photographic Society.—Dead.
*South Suburban Photographic Society.—Pres., F. J. Mortimer, F.R.P.S. Meetings, Plough Hall, High Street, Lewisham. Wednesdays, 8 p.m. Sec., John Nixon, Rydal, Ingleside Grove, Blackheath.

Spen Valley Photographic Society. — Pres., T Brearley.

Meetings, The Museum, Liversedge, First Wednesdays. Sec.,

John T. Whittall, Mona Cottage, Cleckheaton.

Stafford Photographic Society.-Pres., George Thorneycroft. Meetings, Weiss and Fowke's Studio, Victoria Road, First and Third Mondays, October to May. Sec., Herbert A. E. Hey, Tillington, Stafford.

*Staines and District Photographic Society.-Pres., John Ashby, J.P. Meetings, Congregational Schoolroom, First and Third Tuesdays, 8 p.m. Ex., January. Sec., F. W. Memory, "The Cot," Staines.

Stockport Photographic Society.—Pres., C. H. Carrington.

Meetings, Mechanics' Institute, Second and Fourth Wednesdays, 8 p.m. Sec., Allen Bann, 120, Chatham Street, Stockport.

- Stoke-on-Trent Photographic Society. Pres., Rev. H. V. Stuart. Meetings, Church Institute, Alternate Wednesdays from September 15. Sec., J. Henry Roe, 14, Edward Street, Stoke-on-Trent.
- Stone and District Photographic Society.—Pres., W. Meakin.

 Meetings, Congregational Schools, Last Wednesdays. Sec., R. D.

 Hetherington, 15, Arthur Street, Stone, Staffs.
- *Stratford G.E.R. Mechanics' Institution (Photographic Section).—Pres., S. D. Holden, F.R.P.S. Meetings, G.E.R. Mechanics' Institution, Store Street, Wednesdays, October to April, 8 p.m. Ex., March. Sec., A. Woolford, 16, Grove Green Road, Leytonstone, N.E.
- Streatham Photographic Portfolio (and Society).—Meetings, 300, Streatham High Road, Last Fridays, 8 p.m. Sec., Frank E. Huson, 56, Salford Road, Streatham Hill, London, S.W.
- *Sunderland Photographic Association.—Pres., Wm. Milburn.

 Meetings, Subscription Library, Alternate Thursdays from October
 14, 8 p.m. Sec. Wm. E. Kieffer, Stirling Street, Sunderland.
- Sutton and District Photographic Society.—Pres., Alfred Clough. Meetings, Sutton Mill Institute. Sec., George E. Bland, Bridge Road, Sutton Mill, West Keighley, Yorks.
- *Sutton Photographic Club.—Pres., C. Thwaites. Meetings, Public Hall Chambers, Fridays, from October to April, 8.30 p.m. Sec., Vivian Jobling, Wolferton, Gordon Road, Carshalton, Surrey.
- Swadlincote and District Photographic Society.—Pres., G. S. Bragge. Meetings, Baptist Parlour, First and Third Thursdays. Sec., G. T. Forster, High Street, Woodville, nr. Burton-on-Trent.
- *Swansea Camera Club. Pres., Paul Courtois. Meetings, 14, Temple Street, Mondays, 8 p.m. Sec., R. D. Burnie, 14, Temple Street, Swansea.
- Tamworth and District Photographic Society.—Pres., Horace C. Goostry. Meetings, 15, Market Street, First and Third Tuesdays. Sec., John W. Parker, 17, Heath Street, Tamworth.
- *Thornton Heath Photographic Society.—Pres., R. A. Mac-Kenzie. Meetings, Members' houses. Sec., Geo. W. Stacy Bush, 10, Melfort Avenue, Thornton Heath, Surrey.
- Todmorden Photographic Society.—Pres., William Ormerod, J.P. Meetings, Ridge Lane, First Mondays. Sec., John A. Kershaw, 30, Hare Hill Street, Todmorden.
- *Tollington Park Old Tollingtonians Society (Photographic Section). Pres., E. A. Butler, B.Sc. Meetings, Tollington Sehools, Muswell Hill and Tollington Park. Sec., Robert Fouracre, 89, Tollington Park, London, N.
- *Torbay Camera Society.—Pres., Colonel W. Fothergill Macmullen. Meetings, First Wednesdays, 3.30 p.m. Sec., Dr. Harley Gough, Glenallon, Torquay.
- Tring Camera Club.—Dead.

 *Tunbridge Wells Amateur Photographic Association.—

 Pres., Francis G. Smart, M.A., J.P. Meetings, Club Room,

 Dudley Institute, Dudley Road, First Thursdays and Third

 Wednesdays. Sec., H. Wild, Berrycroft, Warwick Park, Tun
 bridge Wells.

- Tynemouth (Borough of) Photographic Society. Pres., James Barr. Meetings, Presbyterian Hall, North Shields, Alternate Thursdays from October 7. Sec., Joseph R. Johnston, 29, Drummond Terrace, North Shields.
- Tyneside Geographical Camera Club. Pres., J. G. Smith. Meetings, Geographical Institute, First Wednesdays, 7.30 p.m. Sec., John Scott, 10, Mosley Street, Newcastle-upon-Tyne.
- Uddingston Amateur Camera Club.—Pres., James Rowat. Meetings, 44, Old Mill Road, Fridays. Ex., February. Sec., G. A. Robin, 4, Kyle Park, Uddingston, N.B.
- *Ulster Photographic Society.—Pres., S. W. Allworthy, M.A. Meetings, 36, Garfield Chambers, Belfast, First and Third Mondays, September to May. Sec., David James Hogg, 3, Trinity Street. Belfast.
- *Waddon Camera Club.—Pres'dt's, J. Whelps and W. W. Topley. Meetings, Offices of Croydon Gas Company. Sec., Frank F. Wood, 11, Milton Road, Wallington.
- Wakefield Photographic Society. Pres., J. H. Chaplin. Meetings, Church Institute, 8 p.m. Ex., March. Sec., George W. Johnson, Newton Hill, Wakefield.
- Walkley (Sheffield) Conservative Club Camera and Optical Lantern Society.-Pres., S. Hall-Downing. Meetings, Club Rooms, 147, Howard Road, Sheffield, First Thursdays. Sec., S. Hall-Downing, 288, South Road, Sheffield.

Wallasey Amateur Photographic Society .- Pres., Robert Tunnecliffe. Meetings, 110, Brighton Street, Seacombe, Alternate Mondays from January 10. Sec., William Hayes, 110, Brighton Street, Seacombe.

*Wallington Camera Club.-Pres., The Rector of Beddington. Meetings, Sterndale Rooms, Fourth Tuesdays, September to May. Sec., John A. Lash, London & South-Western Bank, Wallington,

Walsall Photographic Society.—Pres., E. J. Shaw, J.P. Meetings 5, Arcade Balcony, Bradford Street, Mondays, 8 p.m. Sec.

W. T. Comer, 4 and 6, Arcade, Walsall.

*Walthamstow Photographic Society. - Pres., E. Clarke, F.R.G.S. Meetings, The Hall, Vestry Road, First and Third Mondays, 8 p.m. Sec., Thomas R. Nunn, 29, The Drive, Walthamstow, Essex.

Walton (Liverpool) Photographic Society.—Pres., H. Nicholls. Meetings, Walton Church Schools, Second Wednesdays, 8 p.m. Sec., T. Bickerstaff, 79, Rawcliffe Road, Walton, Liverpool.

Warrington Photographic Society.—Pres., W. E. Brown, B.A. Meetings, Old Academy, Wednesdays, October to April. Sec., A. C. Smithson, Rush Green, Lymm.

*Watford Camera Club.—Pres., The Lord Hyde. Meetings, 100. High Street, Thursdays, 8.30 p.m. Ex., October. Sec., W. J.

Edmonds, 3, The Parade, Watford.

*Watford Photographic Society. - Pres., Lady Ebury. Meetings, Public Library, Alternate Fridays from October 8. Sec., H. Langford Lewis, 78, Gladstone Road, Watford. Wath and District Photographic Society.—Particulars not received from Secretary.

*Wearside Camera Club. - Pres., B. B. Mewburn. Meetings, Fawcett Street Café, Sunderland, First and Third Tuesdays.

Sec., Bert Jackson, 12, Holmeside, Sunderland.

*Wellcome Photographic Club.—Pres., H. S. Wellcome. Meetings, Wellcome Club and Institute, Dartford. Sec., Frank C. Starnes, Wellcome Club and Institute, Dartford, Kent.

Wembley and Sudbury Camera Club.—Pres., J. H. Churchill. Meetings, St. John's Schoolroom, Wembley, Alternate Thursdays from October 3, 8 p.m. Sec., Miss Woodroffe, Layfield, Sudbury.

Middlesex.

Wesley Guild Camera Club.—Pres., Geo. Blackledge. Meetings, Wesley School, Abbey Street, Accrington. Sec.. W. E. Ellis, 36, Beech Street, Accrington.

*West Bromwich Photographic Society. - Particulars not

received from Secretary.

West Calder Camera Club .- Pres., Robert Calder. Meetings, Masonic Hall, Alternate Tuesdays, from October 5, 7.45 p.m. Sec., Lawrence Girdwood, 27, Hermand, West Calder.

Westhoughton Amateur Photographic Society.-Particulars

not received from Secretary.

*West London Photographic Society.—Dead.

*West Surrey Photographic Society.-Pres., Dr. H. Pelham Webb. Meetings, The Railway Hotel, 110, Battersea Rise, S.W., Wednesdays. Sec., Charles A. Clear, 10, Grandison Road, Clapham Common, S.W.

*Weybridge and District Photographic Society.-Pres., J. Lyle. Meetings, Parish Room, Alternate Thursdays from October

7. Sec., C. J. Garratt, Bank House, Weybridge.

*Weymouth Photographic Literary and Natural Science Club.—Pres., A. G. Alletsee. Meetings, Mondays, 8 p.m. Sec.,

John C. Talbot, Exmouth House, Weymouth.

Whitby Camera Club.—Pres., J. M. Botham. Meetings, Council Schools, Cliff Street, Fridays. Sec., Woodhouse Parkinson, Ocean Road, West Cliff, Whitby.

Whitley District Camera Club.-Pres., Dr. J. M. Lazenby. Meetings, Assembly Rooms, First and Third Tuesdays, 8 p,m. · Sec., A. B. Roxburgh, 21, Grafton Road, Whitley Bay.

Widnes Photographic Society.—Particulars not received from

Secretary.

*Willesden Polytechnic Photographic Society.—Pres., W. B. Luke, J.P. Meetings, Polytechnic, Priory Park Road, Kilburn. Second, Third, and Fourth Mondays, 8 p.m. Sec., William Axten, Ravenscourt, Ealing Road, Wembley.

*Wimbledon and District Camera Club.—Pres., Peter Keary Meetings, 6, The Broadway, Second and Last Thursdays, September to May. Sec., Herbert Brigden, 12, Montague Road,

Wimbledon, London, S.W.

*Wimbledon Park Photographic Society. - Pres., Dr. D. Kernohan. Meetings, 19, Replingham Road, Southfields, S.W., Wednesdays, 8.15 p.m. Sec., W. Cheeseman, 460, Merton Road, Wandsworth, London, S.W.

*Windsor Camera Club.—Pres., Lord Edward Spencer Churchill.

Meetings, Royal Albert Institute. Sec., Thomas J. Cartland,
Thames Side, Windsor.

Wishaw Photographic Association.—Pres., William Calderhead.
M.A., B.Sc. Meetings, Stanley Place, Young Street. Ex.,
December-January. Sec., R. Telfer, 138, Glasgow Road, Wishaw.

Wolverhampton Photographic Society.—Pres., F. Walton.

Meetings, Library, Waterloo Road, First Mondays and Third
Wednesdays. Sec., Dr. Turton, 6, Bath Road, Wolverhampton.

*Woodford Photographic Society.—Meetings, Wilfrid Lawson Hotel, First, Second, and Third Wednesdays, October to April. Sec., F. G. Emler, Murton Villa, Chelmsford Road, Woodford.

*Woolwich Photographic Society.—Pres., Charles Churchill, F.R.P.S. Meetings, Old Town Hall, William Street, First and Third Thursdays, October to April inclusive. Ex., March. Sec., S. A. Saffron, 19, Winchester Street, Silvertown, London, E.

Worcestershire Camera Club and Photographic Survey Society. - Pres., Rt. Hon. Earl Beauchamp, K.C.M.G. Meetings, 1A, High Street, Wednesdays, 8 p.m. Ex., March. Sec., Geo. Harry Haycox, 25, St. Wulstan's Crescent, Worcester.

Workington Photographic Society.—Pres., W. L. Fletcher.

Meetings, Liberal Club, Second and Fourth Mondays, October to
April. Sec., John R. Taylor, 15, Station Road, Workington.

*Worthing Camera Club.—Pres., W. Ayton Gostling, M.D. Meetings, Club Rooms, 11, Liverpool Terrace, Tuesdays, November to April, 8.15 p.m. Ex., March. Sec., Edmund F. H. Crouch, 11, South Street, Worthing.

Yarmouth (Great) and District Camera Club. — Pres., Dr. Beach. Meetings, 156, King Street, Second and Fourth Wednesdays. Sec., J. Shearman, 156, King Street, Great Yarmouth.

York St. Peter's School Natural History and Photographic Society.—Pres., Rev. R. Oborne Walker. Meetings, Museum, St. Peter's School, York, Saturdays (in term time), 6 p.m.

POSTAL CLUBS.

Amateur Postal Camera Club (The).—Sec., W. L. G. Bennett, Kingswear, South Devon.

Anglo-Celtic Postal Photographic Society.—Dead.

Architectural Postal Photographic Club.—Sec., J. E. Underwood, Bedford Square, Loughborough.

Argosy Postal Photographic Club.—Sec., Rev. C. F. Lowry Barnwell, Stramshall Vicarage, Uttoxeter, Staffs.

Boy's Own Postal Photographic Club.—Sec., J. E. Hardwich, 14, Azalea Terrace South, Sunderland.

Camera & Co. Postal Club.—Sec., H. Wild, "Berrycroft, Blatchington Road, Warwick Park, Tunbridge Wells.

Great Effort (The).—Sec., Cyril Burrage, "Egton," Beaconsfield Bucks.

Hand Camera Postal Club.—Sec., George V. Myatt, "Sunning-dale," West Worthing.

Harpur Stereoscopic Postal Union .- Sec., G. A. Gearey, 33, Brereton Road, Bedford.

Lantern Slide Exchange Club.—Sec., J. S. Hawker, Mutley

House, Plymouth.

Light and Truth Postal Photographic Club.—Sec., George Harry Haycox, St. Wulstan's Crescent, Worcester.

National Postal Photographic Society. - Sec., Frank Gardner,

32, Popple Street, Sheffield. Perseverance Postal Camera Club.—Sec., Mrs. F. L. Carslake,

Daracombe, Newton Abbot.

Postal Camera Club - Sec., J. C. Warburg, 21, Pembridge Gardens, London, W.

Postal Photographic Club.—Sec., Reginald A. R. Bennett, M.A., Walton Manor Lodge, Oxford.

Postal Pictorial Photography Club. — Sec., Mrs. Mary C. Cottam,

Burleigh Street, Clements Road, Bournemouth. Postal Salon.—Sec., R. Stockdale, 13, Mount Preston, Leeds.

Quarterly Photographic Portfolio. - Sec., Leonard Gray Castle,

"Danetree," Norman Road, Sutton, Surrey.

Ripon Portfolio Club. - Sec., H. Bulmer Rudd, 29, Westgate, Ripon. Secretaries' Postal Photographic Society.—A circulating folio exclusively for hon, secs. or permanent officials of photographic societies containing prints, and dealing with general matters relating to photography, and the working of societies, clubs, etc. Hon. Sec., S. G. Kimber, F.R.P.S., Oakdene, Highfield, Southampton.

Somerset Postal Photographic Society. - For advanced workers. Sec., Bernard J. Mitchell, 3, Willow Vale, Frome,

Somerset.

Stereoscopic Society (The). - Sec., B. Diveri, B.A., Huntly, N.B. Sun and Company Postal Club.—Sec., Martin J. Harding, Oakdene, Church Stretton.

Talbot Album Club. - Sec., F. H. Langdon-Davies, Rutland Place,

Boyne Hill, Maidenhead.

United Stereoscopic Society (The).—Sec., Albert J. Snow, 74, Lloyd Row, Walthamstow, London, E.

Universal Correspondence Camera Club. - Sec., S. Rubery, jun., 49, Lonsdale Road, Wolverhampton.

Wessex Photographic Postal Club.—Dead.

Zodiac Camera Club.-Hon. Sec., Miss Agnes B. Warburg, 8, Porchester Terrace, London, W.

Zoological Photographic Club. - Sec., Jasper Atkinson, Glen Esk, Alma Road, Headingley, Leecs.

COLONIAL PHOTOGRAPHIC SOCIETIES.

Adelaide Camera Club.—Pres., P. H. Williams, Meetings, Y.M.C.A., Gawler Place, Adelaide, First Thursdays, 8 p.m. Sec., P. Töpperwien, Commonwealth Audit Office, G.P.O., Adelaide, South Australia.

Auckland Camera Club.—Pres., E. W. Payton. Meetings, Club Room, 39, Victoria Street, Second Monday in month. Sec., A.

Graham, 43, George Street, Auckland.

Auckland Y.M.C.A. Camera Club.—Pres., T. F. Hill. Meetings, Y.M.C.A., First Wednesdays, 7.45 p.m. Sec., Fredk. E. Corv.

Y.M.C.A., Auckland, N.Z.

Australian School of Photographers. - Pres., F. A. Campbell. Meetings, Working Men's College, Bowen Street, Melbourne, First Mondays. Sec., W. R. Huntsman, Addlestone House, 72, McArthur Place, Carlton, Melbourne, Australia.

Ballarat Camera Club.—Pres., John Gazzard. Meetings, Ballarat School of Mines, Second Wednesdays. Sec., George H. Hutson,

226, Raglan Street, Ballarat, Victoria, Australia.

Ballarat Photographic Club.-Pres., Prof. A. Mica Smith. Meetings, School of Mines, Wednesdays in each month. Sec., Fred J. Mantell, Ballarat School of Mines, Ballarat, Victoria.

Bathurst Amateur Camera Club.—Pres., E. T. Webb. Meet-

ings, Second Thursday each month. Sec., H. J. Baldwin, Bath-

urst. New South Wales.

Beechworth Camera Club.—Pres., C. Hembrow. Public Library, Beechworth, Victoria, Second Thursday in each

moath, 8 p.m. Sec., R. W. Lover.

Bendigo Amateur Photographic Association.-Pres., J. G. Austen. Meetings, School of Mines, every alternate Thursday. 8 p.m. Ex., June. Sec., Jas. Miller, Bath Corner, Bendigo, Victoria.

Bombay Photographic Society.—Pres., Prof. T. K. Gajjar, M.A., B.Sc., F.C.S. Meetings, The Techno-Chemical Laboratory, Girgaum, Bombay. Secs., Bomanji Dorabji Padamji and Vasanji P. Dalal, M.A., B.Sc., Techno-Chemical Laboratory, Girgaum, Bombay.

Boulder Technical School Camera Club. - Pres., J. F. Lynch. Meetings, Technical School, Mondays, 8 p.m. Sec., F. A. Davis,

Technical School, Boulder City, West Australia.

Burnett Camera Club.—Pres., George Henry Finch. Meetings, School of Arts, Bundaberg, Third Tuesdays, 8 p.m. Sec., Horace John Page, Fargo Street, Bundaberg, Queensland, Australia.

Cairns Amateur Photographic Society.—Pres., R. G. Catt. Meetings, School of Arts, 2nd Thursdays, 8 p.m. Sec., Arthur F.

Hunt, Cairns, Queensland, Australia.

*Cape Town Photograp'tic Society. - Pres., J. D. Cartwright, M.L.A. Meetings, Old Town House, Greenmarket Square, First Thursdays. Sec., H. Mudie Thomson, P.O. Box 896, Cape Town.

Cape Town Camera Club.—Pres., Walter Johnson. Meetings, 10, Church Street, Alternate Fridays, 8 p.m. Sec., W. Askew-Way,

P.O. Box 802, Cape Town.

Castlemaine Amateur Camera Club. - Pres., H. McBean. Meetings, School of Mines, Castlemaine, Alternate Wednesdays. Sec.,

C. A. Northcote, Market Square, Castlemaine, Victoria.

Ceylon Amateur Photographic Society.-Pres., J. H de Saram, C.M.G. Meetings, Ferguson Memorial Hall, Last Fridays. Ex., August. Sec., Andreas Nell, L.M.S., M.R.C.S., The Victoria Memorial Eye Hospital, Colombo.

*Christchurch Photographic Society.-Pres., W. H. Clark. Meetings, 154, Worcester Street, First Tuesdays. Sec., E. Harding,

c/o Wallace and Co., High Street, Christchurch, N.Z.

- Clifton Hill Amateur Photographic Club.—Pres., W. P. Anderson. Meetings, 330, Queen's Parade, North Fitzroy, Second Mondays. Sec., F. Dutton, 120, Fenwick Street, Clifton Hill, Melbourne, Australia.
- Cowra (N.S.W.) School of Arts Amateur Photographic Society. - Pres., S. Stevenson. Meetings, Cowra School of Arts, Third Tuesday of each month. Sec., John P. McPhee, Kendal Street, Cowra, New South Wales.
- Dai-Nippon Shashin Kyokwi (Photographic Association of Japan).— Pres., H. E. Viscount M. Nagaska. Meetings, Kwazoku-Kwaikan, 1, Uchiyamashitacho, Tokyo. Sec., K. Ogura. 77, Minami-Enokimachi, Ushigome, Tokyo.

Dunedin Photographic Society.—Pres., Donald Reid. Meetings, South British Insurance Buildings, Liverpool Street, Second Thursdays, 8 p.m. Sec., Miss C. H. Mackenzie, c/o London Photo Depot, Princes Street, Dunedin, N.Z.

East Malvern Amateur Photographic Club.—Pres., Rev. J. B. Gason. Meetings, St. John's Schoolroom, East Malvern, Second Fridays, 8 p.m. Sec., Arthur H. Smith, Kilburn, 18, Wattle-

tree Road, Malvern, Victoria.

Etonia Camera Club.—Pres., R. T. Eaton. Meetings, Rest Room,
The T. Eaton Co. Limited Stores. Sec., Eugene L. Beaupré,
c/o City Advertising Department, The T. Eaton Co., Limited,
Toronto, Canada.

Gawler Photographic Society.—Pres., H. L. Marsh. Meetings, Alternate Tuesdays from January 4. Sec., Arthur A. Johnson,

King Street, Gawler, South Australia.

Gordon College Amateur Photographic Association.—Pres., Thos. Lord. Meetings, Gordon College, Fenwick Street, Geelong, Wednesdays. Sec., Horace L. S. Potter, 97, Weller Street, Geelong, Victoria, Australia.

Greytown Camera Club.—Pres., Rev. Canon G. E. Pennington.

Meetings, Club Room, Comin's Buildings, Alternate Thursdays.

Ex., March. Sec., Frank Carter, P.O. Box 28, Greytown, Natal.

Gulgong Amateur Photographic Society.—Pres., Archdeacon Geer. Meetings, Club Room, every alternate Tuesday. Sec., A. P. Lambert, Public School, Gulgong, New South Wales.

Hamilton Association Camera Club, Canada.—Pres., J. M. Eastwood. Meetings, Hamilton Association Rooms, Public Library. Sec., W. Henry Edwards, 168, Main Street, E., Hamilton, Ontario, Canada.

Hawke's Bay Camera Club.—Pres., F. W. Williams. Meetings, Napier, N.Z. Sec., T. Bruce Bear, c/o Napier Gas Co., Ltd.,

Napier, N.Z.

Ipswich (Queensland) Amateur Photographic Society.—Pres., R. Henderson Johnston. Meetings, Hughes and Cameron's Buildings, last Tuesdays, 8 p.m. Ex., May. Sec., Pearson W. Cameron, Nicholas Street, Ipswich, Queensland, Australia.

Johannesburg Photographic Art Circle.—Meetings, Cuthbert's Buildings, First Tue-days. Ex., November. Sec., Harold Smith,

71. Cuthbert's Buildings, Johannesburg.

Kapunda Photographic Club.—Pres., J. E. A. Klose. Meetings, School of Mines, alternate Tuesdays, 7.30 p.m. Ex., September. Sec., Thos. Warner, Chapple Street, Kapunda, South Australia.

King William's Town Photographic Society.-Pres., Rev. Jas. Pollock. Meetings, Club Rooms, Museum Buildings. Sec., Henry D. Beck, P.O. Box 103, King William's Town, South Africa.

Lismore Camera Club.—Pres., C. St. H. Syer. Meetings, Studio. Molesworth Street, First Fridays. Sec., Stanley I. Simmons,

Lismore, New South Wales.

Manawatu Camera Club, Palmerston North, N.Z. -Pres. J. H. Perrin. Meetings, Pratt's Hairdressing Saloon. Alternate Wednesdays. Sec., B. Pratt, The Square, Palmerston North, N.Z.

*Maritzburg Camera Club.-Pres., D. M. Eadie, Meetings. Hardy's Chambers, First Wednesday and Third Thursday. Sec., A. R. Hopkins, 4, Hardy's Chambers, Printing Office Street.

Pietermaritzburg, Natal.

Melbourne Working Men's College Photographic Club. Pres., F. A. Campbell. Meetings, College Lecture Hall, Latrobe Street, Melbourne, Alternate Tuesdays, from May 4, at 8 p.m. Sec., Albert A. Bishop, 9, St. George's Road, Malvern, Victoria. Australia.

Montreal Amateur Athletic Association Camera Club.-Pres., C. Power Cleghorn. Meetings, 250, Peel Street.

Robinson, 260, St. James Street, Montreal, Canada.

Mosman Photographic Society.-Pres., D. M. Mitchell. Meetings, Raglan Street, Second Thursdays, 8 p.m. Ex., September. Sec., A. S. Farmer, "Overmorton," Avenue Road, Mosman, Sydney, N.S.W.

Mount Gambier Photographic Club.-Pres., P. C. Kook, Meetings, Chess Room, Institute, First Thursdays. Ex., February,

Sec., Edwin Kluge, Mount Gambier, South Australia.

Mt. Morgan Camera Club.—Pres., D. Baldwin. Meetings, School of Arts, First Saturdays, 7.30 p.m. Sec., J. C. A. Terris, Jeannie Street, Mt. Morgan, Queensland,

Nelson Camera Club .- Pres., C. Y. Fell. Meetings, Hardy Street, Second Tuesday in each month, 7.30 p.m. Ex., October. Sec., H.

A. Hobbs, Hardy Street, Nelson, New Zealand.

Newcastle and District Camera Society.—Pres., J. T. Williams. Meetings, 43, Hunter Street, Alternate Tuesdays. Sec., Montague W. Cramp, Fleming Street, Islington, Newcastle, New South Wales.

New South Wales Tramway Camera Club .- Pres., Thomas Marsh. Meetings, Tram Depôt, Rushcutters Bay, Last Tuesdays, 8 p.m. Sec., H. E. Perfect, "Hazeldeen," Waratah Street, Enfield, Sydney, New South Wales, Australia.

Northern Suburbs Camera Club, New South Wales .- Pres., W. A. Gullick. Meetings, Pymble Club Hall. Third Monday in

each month, 8 p.m. Sec., N. McIntosh.

*Northern Tasmanian Camera Club. -Pres., R. Lewis Parker. Meetings, Club Rooms, Launceston, Third Wednesdays, 8-p.m. Sec., F. Styant-Browne, 112, Brisbane Street, Launceston, Tasmania.

Oriental Photographic Association. - Sec., Kenzaburo Ando, 2-25, Kayacho, Shitaya-ku, Tokio, Japan.

Ottawa Photographic Art Club,—Pres., C. E. Saunders, Ph.D. Meetings, Second Mondays, October to May. Sec., William Ide,

B.A. 447 Riverdale Avenue, Ottawa.

Paeroa Amateur Camera Club.-Pres., E. W. Porritt. Meetings, Club Rooms, Second Mondays, 7.30 p.m. Sec., John Hubbard, Paeroa, Auckland, New Zealand.

Perak Amateur Photographic Society. - Pres., L. Wray, M.I.E.E., F.Z.S. *Meetings*, Poverty Flat, Museum Road, Taiping. Sec., Geo. Bain, Taiping, Perak.

Photographic Association of Canada.—Pres., J. Frank Jackson.

Sec., Fred. L. Roy, Peterborough, Ontario, Canada.

Photographic Employees' Association of New South Wales. -Pres., J. C. Cruden. Meetings, Queen's Hall, Pitt Street, Sydney, Third Monday in each month. Sec., Walter Davies, 58, Cavendish Street, Petersham, Sydney, N.S.W.

*Photographic Society of India.—Pres., Dr. T. F. Pearse, M.D., D.Ph. Meetings, 40, Chowringhee, Second Mondays. Ex., January.

Sec., A. J. Oliver, 40, Chowringhee, Calcutta.

*Photographic Society of New South Wales.—Pres., J. S. Stening. Meetings, 9, Hamilton Street, Sydney, First and Third Tuesdays, 8 p.m. Sec., L. L. Raymond, Box 829, G.P.O., Sydney, N.S.W., Australia.

Port Elizabeth Amateur Photographic Society. - Pres., Wm. Alcock. Meetings, The Athenaum, First and Last Tuesdays, 8 p.m. Ex., July. Sec., B. F. Everitt, Cape Road, Port Elizabeth.

*Queensland Photographic Society.-Pres., W. C. Voller. Meetings, Technical College, Ann Street, Brisbane First and Second Thursdays. Sec., E. Colclough, Department of Public Lands, Brisbane, Queensland.

Rockhampton Camera Club.—Pres., W. S. A. Hunter. Meetings, Club Room, Alma Street, First Thursdays. Sec., A. T. Nelson, c/o P. A. Nelson and Co., Alma Street, Rockhampton, Queensland,

St. John Camera Club, Canada. - Meetings, 65, William Street, St. John, New Brunswick. Sec. J. Kaye Allison, P.O., Box 401,

St. John, N.B., Canada.

Semaphore Photographic Society. — Pres., W. G. Rendall. Meetings, Esplanade, First Mondays, 7.45 p.m. Sec., Charles W. Mart, c/o Dalgety & Co., Ltd., St. Vincent Street, Port Adelaide, South Australia.

*South Australian Photographic Society. - Pres., Charles Radcliffe. Meetings, Institute, North Terrace, Adelaide, Second Thursdays, 8 p.m. Sec., A. H. Kingsborough, 51, Rundle Street,

Adelaide, South Australia.

Southern Tasmanian Camera Club.-Pres., A. G. Webster. Petersen's Chambers, Macquarie Street, Hobart. Meetings, Second Tuesdays, 8 p.m. Sec., Alfred Propsting, 105, Elizabeth Street, Hobart.

Stratford (N.Z.) Camera Club.—Pres., A. W. Reid. Meetings, A. Newton's Studio, Broadway, First Tuesdays, 7.30 p.m. Sec., Walter J. Newton, Swansea Road, Stratford, New Zealand.

Toronto Camera Club.—Pres., Alfred Robinson. Meetings, 2, Gould Street, Mondays, October to April. Sec., Hugh Neilson, 2, Gould Street, Toronto, Ontario, Canada.

Toronto Canoe Club Camera Club.—Pres., H. H. Fullerton. Meetings, Club House, Third Tuesdays. Sec., T. F. Livingstone, 60, Richmond Street East, Toronto, Canada.

Toronto School of Science Camera Club. - Pres., J. E. Keppy. Meetings, Engineering Building, University of Toronto, Alternate Thursdays from October 15. Ex., March. Sec., U. R. McCollum, University of Toronto, Engineering Buildings, Toronto, Ontario, Canada.

Toronto Y. M. C. A. (Central) Camera Club.—Pres., Charles Boles. Meetings, Y.M.C.A. Building, 415, Yonge Street, Second

Tuesdays. Sec., Harry Russell, 292, Yonge Street, Toronto.

Upper Canada College Camera Club.—Meetings, Upper Canada College, Toronto, Ontario. Sec., O. M. Biggar, 249, Simcoe

Street, Toronto, Ontario, Canada.

*Victoria Amateur Photographic Association.—Pres., F. A. Kernot. Meetings, Association Rooms, 57, Swanston Street, Melbourne, Second, Third, and Fourth Wednesdays. Sec., D. W.

Paterson, 57, Swanston Street, Melbourne.

Victorian Ladies' Photographic Society.—Pres., Miss Agnes Thomson. Meetings, Working Mea's College, Photographic Lecture Room, Bowen Street, Melbourne, Second Tuesdays. Sec., Miss Lucy Archibald, 1, Pollington Street, St. Kilda, Victoria, Australia.

*Wanganui Cam ra Club.-Pres., C. W. Babbage. Meetings, Club Room, Ridgeway Street. Sec., G. Bolton, Bank, New South

Wales, Wanganui, New Zealand.

*Wellington Camera Club.—Pres., A. de B. Brandon. Meetings, Exchange Buildings, Lambton Quay, Second Thursday in each month. Sec., J. A. Heginbotham, Wellington, New Zealand. Wellington College Camera Club.—Pres., A. C. Gifford, M.A.

Meetings, Wellington College, Wellington, N.Z., Mondays during term. Sec., G. G. Watson, Wellington College, Wellington, N.Z.

West Australian Photographic Society (Perth).—Meetings, Third Wednesday in each month. Sec., A. R. L. Wright, Public

Works Department, Perth, West Australia.

Winnipeg Camera Club.—Pres., J. G. Norris. Meetings, 273, Portage Avenue, Third Tuesdays. Ex., July. Sec., Jas. M. Iredale, 7, Hample Building, Portage Avenue, Winnipeg, Manitoba.

AMERICAN SOCIETIES.

The inclusion of a list of Photographic Societies in the United States is discontinued, as the space in the text portion of the "Almanac" is appropriated by information of more general interest. Since only a small proportion of the readers of the "Almanac" are in a position to make any use of this American directory, the Editor believes he is consulting the wishes of the majority in omitting it from the present and future editions. The directory of American societies last appeared in the "Almanac" for 1905.

PHOTOGRAPHIC BODIES.

Under the following heading are arranged particulars of the chief photographic associations which cannot be appropriately included in the list of photographic societies.

THE PROFESSIONAL PHOTOGRAPHERS' ASSOCIATION.

In Affiliation with the Chambre Syndicale de la Photographie

et de ses Applications, of Paris.

The Association was founded in March, 1901, for the purpose of promoting the interests of professional photography, the assistance of its members in their business dealings, and rendering them advice and assistance when in legal or other difficulties.

All professional photographers in business for themselves, or as

managers of firms or companies, are entitled to membership.

The subscription is 5s. per annum.

Members' meetings are held on the second Fridays in October and January. The annual general meeting is held on the second Friday in March. The meetings are held at the Royal Photographic Society, 35, Russell Square, W.C.

The committee generally meets the second Thursday in each month,

except July and August.

Members are entitled to transfer existing fire policies to a first-rate office at premiums 20 per cent. less than they are paying. Special arrangements have been made for insuring members' liability under

the Workmen's Compensation Act.

The Association publishes a handbook annually containing much valuable information concerning copyright and other laws which particularly affect photographers. The P. P. A. Circular, published at intervals, in addition to information concerning the work of the Association, also contains much useful information upon matters of interest and importance to professional photographers.

OFFICERS, ETC.

PRESIDENT.—Lang Sims.
Ex-President.—H. A. Chapman, J.P.
Members of Committee. Country.

London. Mer Bridge, F. A. Chase, H. Gordon. Ellis, Alfred. Elliott, Ernest C. Fry, S. Herbert. Hull, H. Edmonds. Langfier, L. Mackie, Alexander. Scamell, Edgar. Skillman, C. H. Speaight, R. N. Willson, R. Fellows.

Birtles, T. (Warrington).
Comley, Henry J. (Stroud).
Gill, Wm. (Colchester).
Hawkings, W. H. (Plymouth).
Illingworth, W. (Northampton).
Lankester, P. (Tunbridge Wells).
Moffat, F. P. (Edinburgh).
Protheroe, L. R. (Bristol).
Robinson, R. W. (Redhill).
Spink, H. C. (Brighton).
Turner, T. C. (Hull).
Warrington, W. (Liverpool).

Hon. Secretary.—A. Mackie, 89, Albany Street, N.W. Hon. Treasurer.—Lang Sims, 437, Brixton Road, London, S.W. Hon. Solicitor.—P. E. Marshall, 35, Bedford Row, London, W.C. Auditors.—Frank Turner and C. St. J. Vaughan.

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PROFESSIONAL PHOTOGRAPHERS' SOCIETY OF NEW YORK.

PRESIDENT.—Harry A. Bliss.

SECRETARY.—Howard D. Beach, 469, Virginia Street, Buffalo, New York.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

The Twenty-fifth Annual Meeting will be held at Scarborough, July, 1910, under the presidency of Godfrey Bingley. Retiring President—H. Snowden Ward, F.R.P.S.

The Photographic Convention was founded in 1886 for the advancement of Photography, and to afford opportunities for personal intercourse and exchange of ideas amongst those interested in the

Art, from all parts of the United Kingdom.

Meetings have been held at the following Centres:—1886, Derby; 1887, Glasgow; 1888, Birmingham; 1889, London; 1890, Chester; 1891, Bath; 1892, Edinburgh; 1893, Plymouth; 1894, Dublin; 1895, Shrewsbury; 1896, Leeds; 1897, Great Yarmouth; 1898, Glasgow (second visit); 1899, Gloucester; 1900, Newcastle-on-Tyne; 1901, Oxford; 1902, Cambridge; 1903, Perth; 1904, Derby (second visit); 1905, Dublin (second visit); 1906, Southampton; 1907, Hereford; 1908, Brussels; 1909, Canterbury.

PAST PRESIDENTS.—J. Traill Taylor, Andrew Pringle, C. H.

Bothamley, George Davison, William Bedford, George Mason, Sir Howard Grubb, A. Haddon, H. P. Robinson, F. P. Cembrano, John Stuart, William Crooke, Thomas Bedding, Sir William Herschel, Bart., Sir Robert S. Ball, Sir Robert Pullar, G. Herbert Strutt, Dr. John Joly, E. J. Humphery, Alfred Watkins, Sir Cecil Hertslet, H.

Snowden Ward.

The Council of the Convention is empowered to make grants in aid of photographic research.

MEMBERS OF COUNCIL.

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THE ARTISTIC COPYRIGHT SOCIETY.

PRESIDENT.—*Sir Lawrence Alma-Tadema, O.M., R.A.
ACTING VICE-PRESIDENT.—*Frank Dicksee, R.A.

GENERAL COMMITTEE.—*George W. Agnew M.P. (Chairman), Lockett Agnew, *Edwin Bale, R.I., Frank Bishop, H. Scott-Bridgwater, Thomas Brock, R.A., Walter Dowdeswell, Sir Luke Fildes, R.A., O. Gutekunst, A. H. Haig, R.E., G. C. Haité, R.I., Marshall Hall K.C., E. B. Haynes, Marcus B. Huish, Seymour Lucas, R.A., J. MacWhirter, R.A., Sir W. Orchardson, R.A., Joseph B. Pratt, T. E. Scrutton, K.C., *W. Reynolds-Stephens, Alexander Tooth, and Adolph Tuck.

Solicitor.—Herbert Voysey.

HONOBARY TREASURER.-C. Morland Agnew.

HONORARY SECRETARY .- *D. Croal Thomson, 120, Pall Mall.

This Society has announced as its first activity "the endeavour to push through Parliament a Copyright Bill, such as will be acceptable to its members and beneficial to the community at large."

EXTRACTS FROM THE RULES.

That the Society is formed with the object of promoting the interests of all concerned in artistic copyright.

That the attention of the Society shall be specially directed to the improvement, amendment, and codification of the laws relating to Artistic Copyright in the United Kingdom, and to the promotion of a Bill in Parliament to that end, and eventually to induce the Colonial Legislatures to bring their copyright laws into line with those of the United Kingdom.

That a further object of the Society shall be to take such steps as may be deemed necessary or advisable to prevent piracy or infringement of artistic copyrights, and

To give information on copyright questions to members of the Society.

That painters, sculptors, architects, designers, engravers, owners of works of art, print publishers, print sellers, dealers in works of art, photographers, and all interested in the subject of artistic copyright shall be eligible for membership of the Society.

That election of members shall be vested in the Committee. Application for membership to be made to the Honorary Secretary in writing.

That the annual subscription be £1 1s., payable on January 1.

^{*} These form the Executive Sub-Committee.

THE NATIONAL PHOTOGRAPHIC RECORD ASSOCIATION.
PRESIDENT.—Sir J. Benjamin Stone, M.P.

Hon. Secretary.—Geo. Scamell, 21, Avenue Road, Highgate, London.

HON TREASURER. -A. Graham, F.S.A.

The Association has been founded for the purpose of forming a National Photographic Record of existing objects of interest throughout the British Isles. The photographs are intended to be deposited in the British Museum for public reference. The photographs are in no way restricted to archeological subjects, but include ethnological, geographical, geological subjects, etc. The Central or Standing Committee will receive all prints for the British Museum collection, and, if approved, will mount and deposit them in the British Museum. All arrangements for deposits in county or other museums will be left to local Societies that have undertaken the photographic survey of their respective counties. Prints to be in platinum or some other permanent process, and whole plate, $8\frac{1}{2}$ by $6\frac{1}{2}$, to be considered standard size, but $\frac{1}{2}$ or $\frac{1}{2}$ plate are accepted.

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PHOTOGRAPHIC SURVEY ASSOCIATIONS.

Photographic Survey of Edinburgh and District.

Secretary.—J.s. Oliver, Etinburgh Photographic Society, 38, Castle Street, Edinburgh.

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Headquarters: Essex Museum of Natural History, Romford Road, Stratford.

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Secretary.—H. E. Turner, B.A., B.Sc., 14, Queen's Road, Tunbridge Wells.

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PRESIDENT.—Hon. Henry Cubitt.
SECRETARY.—Frank F. Wood, 11, Milton Road, Wallington.

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The SECRETARY, Public Library, Brighton.

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PRESIDENT, Sir J. Benjamin Stone, M.P. SECRETARY.—Geo. Whitehouse, 7, Wye Cliff Road, Handsworth, Staffs. Hon. Curator (to whom all prints should be sent).—E. A. Biermann, 63, Ludgate Hill, Birmingham.

Hon. Treasurer.—P. T. Deakin, 19, Digbeth, Birmingham.

PHOTOGRAPHIC SURVEY OF WORCESTERSHIRE.
SECRETARY.—Walter W. Harris, 101, High Street, Worcester.

THE LINKED RING.

The Linked Ring is composed of a number of photographic workers with artistic aims. They conduct the Photographic Salon, an annual exhibition of selected pictures at 5a, Pall Mall East, London, W.C. The members of the Linked Ring are as follows:—

C. Yarnall Abbott. Reginald Craigie. John H. Anderson. L. David. J. Craig Annan. George Davison. M. Arbuthnot. F. Holland Day. Ernest R. Ashton. Robert Demachy. Walter Benington. Mary Devens. A. H. Blake, W. B. Dyer. David Blount. Charles Emanuel. F. A. Bolton. Frederick H. Evans. Maurice Brémard. Mrs. Michael Foster. Tom Bright. John Pattison Gibson. Karl Greger. Mrs. Brigman. Maurice Bucquet. Georges Grimprel. W. A. Cadby. J. M. C. Grove. Mrs. Carine Cadby. Hugo Henneberg. Eustace Calland. Theodor and Oscar Lycnel Clark. Hofmeister. Archibald Cochrane. Charles Job. Hector Colard. J. Dudley Johnston.

Mrs. Gertrude Käsebier.
Alexander Keighley.
Thomas Manly.
Alfred Maskell.
F. J. Mortimer.
H. W. Müller.
C. Puyo.
Ralph W. Robinson.
Mrs. E. L. Watson-

Schütze.
Mrs. Sarah C. Sears.
Dr. F. von Spitzer.
Eduard J. Steichen.
Edmund Stirling.
Frank M. Sutcliffe.
Carl Ulrich.
J. B. B. Wellington.
W. Willin

ector Colard. J. Dudley Johnston. W. Willis.
Registrar of the Linked Ring:—Charles Emanuel, 67, Ladbrooke

Grove, London.

Secretary of the Photographic Salon:—Reginald Craigie, 32, Windsor Court, Hyde Park, W.

THE SOCIETY OF COLOUR PHOTOGRAPHERS.
SECRETARY.—Henry J. Comley, Surrey House, Stroud, Glos.
PORTFOLIO SECRETARY.—F. T. Hollyer, 9, Pembroke Square, W.
COMMITTEE.—George E. Brown, F. T. Hollyer, A. J. Newton, E. J.
Wall, and the Secretary.

The Society has for its objects "to further the progress of colour photography." It is open to all interested in colour photography, the annual subscription being 5s.

The avowed activities of the Society are :-

(a.) The mutual interchange of ideas and experiences in colour photography by means of a circulating portfolio of specimens and MSS, which shall include questions and replies.

(b.) To obtain for members assistance from more experienced workers through the medium of the honorary secretary. (c.) To hold an annual exhibition in London, open to members and non-members at the time of the general meeting.

(d.) To form a permanent collection of specimens, apparatus, etc.

THE AFFILIATION OF PHOTOGRAPHIC SOCIETIES WITH THE ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN. CHAIRMAN.—The Right Hon. the Earl of Crawford, K.T., F.R.S. CHAIRMAN OF EXECUTIVE COMMITTEE: P. Bale Rider.

ACTING SECRETARY.—H. Philp, 35, Russell Square, London, W.C. BENEFITS AND PRIVILEGES.—Affiliated Societies are entitled to the

following benefits and privileges :--

The loan of illustrated lectures on photographic and kindred topics, sets of lantern slides, lantern lectures, pictures for exhibition, etc., and interchange of lectures and lecturers between the affiliated societies.

Permits to photograph (see below).

One copy of each issue of the "Photographic Journal," in which are published the proceedings of the Affiliation Committee, the Transactions of the Royal Photographic Society of Great Britain, etc.

Admission to the Annual Exhibition of the Royal Photographic

Society of Great Britain at reduced prices.

Members of affiliated societies joining the Royal Photographic Society of Great Britain receive exemption from the payment of entrance fees, provided they have been for at least two years members of an affiliated society. The secretaries and delegates of affiliated societies are empowered to propose and second the nominations of such candidates.

Temporary use of the accommodation provided by the various

societies to members away from their own districts.

Annual competitions of pictorial photographs and lantern slides

are arranged.

JUDGES OF COMPETITIONS.—A Board of Judges is prepared to meet three or four times per annum, at 35, Russell Square, to adjudicate upon competitions arranged by affiliated societies. The exhibits must be sent to the secretary, with full details of the competition, and it is to be understood that the judges will follow the rules adopted by the conference of judges (see below). The judges will not undertake to criticise any work submitted.

Management.—Every affiliated society has a voice in the management of the affiliation through the two delegates which each is entitled to appoint. The general body of delegates meet at least twice a year, the business in the meantime being conducted by an executive committee. The two delegates appointed by each society need not necessarily be members of the society they represent. The entire income of the affiliation is placed by the Royal Photographic Society in the hands of the executive committee, which has to defray all expenses in connection with the work of the affiliation with the following exceptions:—The Royal Photographic Society provides meeting-rooms, and office accommodation free of charge.

PERMITS TO PHOTOGRAPH. — Arrangements have been made whereby members of affiliated societies will be permitted to photo-

graph in or at the following places without other formality than the production of the Red Book (which is non-transferable), if required by those in charge. This permission is subject to any special arrangements that may be made from time to time by the authorities, and it should be understood that these concessions are granted as a matter of grace and not as rights. Holders of the Red Book are expected to act accordingly :- Alexandra Palace and Park, Bristol Cathedral, Hereford Cathedral, Lichfield Cathedral, Romsey Abbey, Burnham Beeches, *Bushey Park, Coulsdon Common, Farthingdown, Guildford, Abbotts (Trinity) Hospital, Guildford, Town Hall Interior "at convenient times," Guildford, Holy Trinity Church, Guildford, St. Mary's Church, Kenley Common, Riddlesdown, West Wickham Common, *Green Park, *Greenwich Park, *Hampton Court Park, Gardens, and Green, Highgate Wood, *Hyde Park, *Kensington Gardens, *Kew Green, Queen's Park (Kilburn), *Natural History Museum Gardens, *Parliament Square Gardens, *Primrose Hill, *Regent's Park, *Richmond Park and Green, *St. James's Park, St. Paul's Churchyard (to 12 noon), *Victoria Tower Gardens.

The societies forming the affiliation are indicated by an * in the

list of photographic societies preceding and following.

Conference of Judges.—The following rules and recommendations concerning photographic exhibitions, adopted by a meeting of judges, convened by the affiliation on April 11, 1900, and revised in June, 1903, have received the approval of the judges, whose names are published annually in the Photographic Red Book. The committee of the affiliation entertain the hope that every affiliated society will endeavour to conform to them as closely as possible. The rules are known to have proved decidedly beneficial in the past.

RULES.—1. The judges' decision upon the merit of the exhibits shall be final, and they shall not be asked to decide any other point.

2. The judges shall have full power to withhold any award, and this shall be stated in the prospectus.

3. The judges shall have power to exclude all persons from the room while judging.

4. The judges' expenses shall be paid.

5. The judges shall not adjudicate upon pictures exhibited as produced with wares of special trading firms.

6. No award shall take the form of a money prize.

7. Where there is a champion class, pictures which have previously taken awards in Open classes shall be exhibited in the champion class only.

8. An award shall be made to one picture only, whether it is in print, lantern slide, or other form; but in cases where the exhibition rules provide for slides to be exhibited in sets, the award shall be made to the best slide in the best set.

THE SCOTTISH PHOTOGRAPHIC FEDERATION.

PRESIDENT.—Sir Carlaw Martin, LL.D.
SECRETARY.—John B. Maclachlan, Blairgowrie.
SECRETARY (Portfolio).—J. D. Ross, 8, Latch Road, Brechin.

^{*} In those places indicated by an asterisk only hand cameras may be used under this permit, and the photographing of persons or groups is not permitted.

SECRETARY (Lantern Slide) .- R. Marshall, 3, Park Terrace, Grangemouth.

The Federation promotes annually the Scottish Photographic Salon. The 1910 Salon will open in the Albert Galleries, Dundee, on January 29, for three weeks.

SALON SECRETARY.—Vaness C. Baird, Broughty Ferry. BOARD OF SELECTION.—J. Craig Annan, Arch. Cochrane, and W. B. Lamond, R.B.A.

The Federation consists of 47 societies.

THE YORKSHIRE PHOTOGRAPHIC UNION. PRESIDENT .- F. Atkinson (Hull).

HON. BUSINESS SECRETARY .- Ezra Clough, 10, Farcliffe Road, Bradford.

HON. SECRETARY (Lantern Slide Section). -W. H. Houghton, 26, Ravensknowle Road, Dalton, Huddersfield.

HON. SECRETARY (Print Portfolio Section).-Lionel Dickinson, 113, Athol Mount, Ovenden, Yorks.

The Union consists of 29 societies.

THE LANCASHIRE AND CHESHIRE PHOTOGRAPHIC UNION. President.—John Barr, M.B., J.P. (Blackburn).
Secretary.—W. Tansley, 22, Chapel Place, Liverpool.

HON. SEC. (Lantern Slide Section). -T. Hudson, 6, Rigby Street, Nelson. Hon. SEC. (Print Portfolio Section) .- J. Frankland, 8, Greengate, Barrow-in-Furness.

A year-book is published, with a list of lecturers and demonstrators, etc. The Union consists of 51 societies.

MIDLAND PHOTOGRAPHIC FEDERATION. SECRETARY.—Lewis Lloyd, Church Road, Moseley, Birmingham. The Federation consists of 43 societies.

FEDERATION OF THE PHOTOGRAPHIC SOCIETIES OF NORTHUMBERLAND AND DURHAM.

PRESIDENT .- W. S. Corder.

SECRETARY.-James Whittle, F.C.S., 30, Bridge Street, Morpeth. The Federation consists of 15 societies.

THE AMERICAN FEDERATION OF PHOTOGRAPHIC SOCIETIES.

PRESIDENT.-George W. Stevens, Director Toledo Museum of Art,

Toledo, Ohio, U.S.A. SECRETARY.—C. C. Taylor, 3223, Cambridge Avenue, Toledo, Ohio, U.S.A.

Founded for the advancement of pictorial photography, the encouragement of photographic record, etc. The American Salon is promoted annually by the Federation, and after the first exhibition in New York makes a tour of some twelve leading centres.

THE PHOTO-SECESSION.

DIRECTOR.—Alfred Stieglitz. 1111, Madison Avenue, New York, U.S.A. Place of meeting, 291, Fifth Avenue, New York. The Secession holds continuous exhibitions.

THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC

AND

Photographer's Daily Companion

WITH WHICH IS INCORPORATED

The Year Book of Photography and Amateurs' Guide

1910.

EDITED BY GEORGE E. BROWN, F.I.C.

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PREFACE.

Scarcely any change has been made in the arrangement of the contents; it has been found possible to put the directory of photographic societies in more compact form; but that is really the only alteration. The order of the sections of the book and, further, of the sub-sections in each is retained precisely. That uniformity in this respect is desirable is evident from the many letters which reach "The British Journal of Photography" quoting articles and formulae in past "Almanacs," and showing that the back volumes of the "Almanac" are constantly turned to for information. It will be noticed that in many instances in the present volume subjects are connected with what has been previously published by reference to past issues of the "Almanac" so that the volumes permit of recent progress in the various branches of practical photography being rapidly scanned.

It only remains to thank all those who by their suggestions and corrections have assisted in the production of the "Almanac," and to wish them and the friends of the "British Journal" everywhere all success during 1910.

GEORGE E. BROWN,

Editor.

24, Wellington Street, Strand, London, W.C. October 25, 1909.

LONDON: HENRY GREENWOOD & Co.,
Publishers of The British Journal of Photography,
24, Wellington Street, Strand, W.C.

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OBITUARY OF THE YEAR.

Among those whose deaths have taken place since the publication of the 1909 ALMANAC are:—

R. H. Bow (Feb. 17, 1909).

Hector Maclean (April 4, 1909).

R. H. Bow.

Walter Tyler (July 28, 1909).

Douglas Carnegie (Oct. 1, 1909).

R. H. Bow.

In the death of R. H. Bow, at Edinburgh, on February 17, 1909, another of the links connecting us with the earliest days of photography is severed. Mr. Bow had attained the great age of 82, and therefore had largely outlived the reputation of his optical and scientific investigations carried out about the middle of the last century. Indeed, many of Mr. Bow's papers and researches did not at the time receive the attention they deserved, and it was left to Dr. von Rohr in "The British Journal of Photography" some two years ago to remind the present photographic generation of Bow's pioneer work in photographic optics. It was R. H. Bow who, with Thomas Sutton, pointed out the true orthoscopy of a symmetrical lens for one scale of reduction only. Bow also investigated the unevenness of illumination by photographic lenses due to the thinning of the glasses at the margins, and he sought to overcome this defect by tinging the substance of the crown glass. He investigated the conditions of anastigmatism in 1863, and first published a plan of registering the results of anastigmatic calculations.

Mr. Bow also anticipated much of the later work in his views of perspective, and constructed apparatus for the correct observation of views made with a short focus lens. His papers on these subjects, as well as his masterly treatment of stereoscopic photography, appeared in "The British Journal of Photography" and in "The British Journal Almanac." Mr. Bow was a member of the Edinburgh Photographic Society from the year of its foundation (1861) until the time of his death, and in the old days was one of its most

active supporters.

HECTOR MACLEAN.

By the sudden death from heart failure on April 4, 1909, of Hector Maclean there was removed from the photographic world a personality not readily replaced. Mr. Maclean was essentially a commentator on men and things. Gifted with a power of facile expression and a sense of ironic humour, he enlivened many a photographic passage at arms which, but for him, would have been dull. Without a very deep knowledge of the principles of photography he was, nevertheless, a very capable expositor of new processes and methods, and was the author of several text-books and the writer of many articles in the photographic Press. His personal interest in the photographic societies with which he was connected, formerly the Croydon Camera Club, and latterly the Sutton Photographic Club, was very actively displayed. He took a very large share in the survey and record work in the county of Surrey. In the "Morning Post," to which he contributed weekly for some years a column of photographic notes, he brought the current progress

in photography very simply before his lay readers, and in other ways assisted to popularise the use of the camera.

WALTER TYLER.

The death of Walter Tyler, head of the well-known firm of Walter Tyler, Limited, Waterloo Road, London, S.E., took place on July 28, 1909. Mr. Tyler, who for nearly forty years had been a prominent and leading member of the optical lantern trade, retired from active business life about three years ago, hoping to spend some years of ease and recreation at his residence at Teddington, but unfortunately this period of well-earned rest was all too brief. At the time of his death Mr. Tyler was 62 years of age.

DOUGLAS CARNEGIE.

The sad news contained in the London papers of October 1, 1909, came to many photographers with a sensation of grief. For the past few years Mr. Carnegie had been successfully engaged in lecturing upon scientific subjects under the University Extension Society. Yet he himself was subject to moods of depression, during which he took the most pessimistic view of his work. His death in a Darling-

ton hotel came as a tragic ending to this strange illusion.

The son of a doctor, Carnegie was born in China, but received his early education at Staveley Grammar Schoool and at Epsom College. From the latter place he gained an exhibition scholarship of London University, and proceeded to Caius College, Cambridge, where, after a distinguished career in science, securing a double-first in Parts 1 and 2 Natural Science Tripos, he became assistant lecturer and demonstrator in the chemical laboratory of Caius College, a post which he held from 1884 to 1889. In 1890 the care of his health led him to accept the chair of chemistry in Colorado University, U.S.A., but in 1893 he returned to England to become science master at Leys School, Cambridge. For some time also he acted as research chemist to the Cambridge Colour Works, Loughton.

In photography, our readers will no doubt be aware of his work in conjunction with his friend Welborne Piper on the action of bichromate on the silver negative image, published in the "Amateur Photographer" in 1905, experiments which led to the present chromium intensifier. His later papers on the theory of pinhole photography, on the H. and D. photometer, and, quite recently, on the sulphide toning process, were published in the "British

Journal of Photography.

Among others whose deaths have taken place during the past year are:—W. E. Downey, well known in association with his father, Mr. William Downey, as the photographer of Royalty; W. D. Brigham, one of the early photographer workers in Yorkshire; G. W. Morgan, of the well-known Aberdeen firm of photographers, and inventor of the system of dry-mounting named after him; Herr von Jan, who specialised in the photography of the female form; Richard Wicks, of the Brighton Photography Company; Dr. C. E. Merck, partner in the firm of E. Merck, of Darmstadt; Romain Talbot, the oldest member of the photographic trade in Germany; and W. Knapp, head of the well-known Halle publishing firm.

MENTAL ARITHMETIC:

OR, THE PHOTOGRAPHER'S READY RECKONER.

BY THE EDITOR.

N the editorial article which has been a feature of the Almanac for many years the aim has been to provide a review of recent progress in some one sub-section of photography, to deal with some quite new innovation in photographic processes, or to draw together the threads relating to some photographic topic of importance scattered in periodicals throughout a number of years. In selecting a subject for the present year it was therefore natural to think first of the oil and "bromoil" processes, to which much atten-tion is being given by pictorially inclined photographers, and next, perhaps, to the varieties of phosphate printing papers, the characteristic qualities of which have attracted a good deal of interest during the past twelve months (November, 1908, to November, 1909). But in regard to the first of these two subjects it was felt that their chief interest is in the manual operations of "pigmenting" the image, and that the comparatively few and simple modes of chemical treatment prior to this stage of the process do not call for a detailed review. On the other hand, the phosphate emulsion papers are of too recent introduction to warrant a monograph on them. Both they and the "oil" processes are quite adequately and more conveniently dealt with in their respective sections in the "Epitome of Progress."

Meanwhile the idea occurred to me to present to photographers, in what I believe is a simpler and more popular manner than hitherto done, the calculations which have to be made as to reproduction by lenses on a reduced or enlarged scale. We all know that exact optical formulæ exist for this purpose, but I venture to say that not I per cent. of the readers of this "Almanac" would think of making use of them in actual work. Therefore I propose to impress upon those who have shunned all such formulæ the really simple way in which any ordinary lens calculation can be worked out by anyone who knows the usual rules of multiplication and division. It will be seen that the essence of this simplified method is the doing of the calculation in several stages instead of all at once by formula. This

can be done very simply and with quite sufficient accuracy by making the "extra focal distance" (E.F.D.) of image or object the subject of the calculation in place of the conjugate focal length which is usually employed. There is nothing new in the use of the E.F.D.; it will be found mentioned in the "Optical Tables" which have appeared in the "Almanac" for several years past. All I can claim for the following article is that it points out the aid to ready reckoning which is afforded by the E.F.D., when coupled with a recognition of the fact that when it is used certain small values in the calculation may be neglected without in any way affecting the results from the practical point of view. With this much by way of introduction we may come to our subject.

* * * * *

All the ordinary calculations which one requires to make when copying, enlarging, etc., become greatly simplified if one calculates first the so-called "extra focal distance." By this term, "extra focal distance," is meant the distance from the original or from the plate extra to the focal length of the lens. To take an example which will serve both to make clear the "extra focal distances" and to lead to the rule in using them. When copying same size we know that original and plate must each be at a distance from the lens double the focal length of the lens. The state of things may be represented thus in the case of, say, a 6-in. lens:—



Here the extra focal distance (that beyond the focal length of the lens) is 6 ins. on each side, that is to say, when the degree of reduction or enlargement is 1, the extra focal distances are each equal to 1 focal length.

Suppose we are copying to half size (linear) or enlarging to twice size (linear). Again with a 6-in. lens we may calculate from the formulæ that the distances are as follows:—

When copying :-

Fig. 3.

Here the extra focal distances are 12 ins. and 3 ins., and we notice that when the scale of reduction or enlargement is 2, the greater extra focal distance is twice the focal length of the lens and the smaller is half the focal length of the lens. Similarly, if the scale of reduction or enlargement is 3, these extra focal distances are three times and one-third respectively the focal length of the lens. It will be seen that so long as we leave out for the moment from our calculations the one focal distance on either side of the lens the matter resolves itself into the simplest form of arithmetic. It will help us to work on this system if we imagine the lens pierced by a solid rod which projects on either side to a distance equal to the focal length.

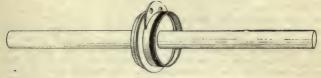


Fig. 4.

Until our calculation is well-nigh done we must regard the space occupied by the bar as a kind of optical no-man's land, not to be considered until we have found the extra focal distances, to each of which latter we then add the focal length of the lens. Let us now state the very simple general rule when finding the extra focal distances and then see how very much more simple it is in use than the formulæ of conjugate foci which are generally given in the textbooks, and, further, how very simple the common lens calculations of everyday use then become.

When copying or enlarging, say, four times, the greater extra focal distance is four times the focal length of the lens and the smaller extra focal distance is a quarter the focal length of the lens. Similarly five times and one-fifth, for a scale of five times, and so on for any given scale of enlargement or reduction.

To arrive at the actual distances from lens to the original and from lens to sensitive plate or paper one focal length is added to each extra focal distance.

Example, copying on quarter scale with 6-in. lens :-

Greater extra focal distance is 6 ins. $\times 4 = 24$ ins. Smaller extra focal distance is 6 ins. $\div 4 = 1\frac{1}{2}$ ins.

Adding the focal length in each case we get:-

Extra focal distance	24	ins.
One focal length	6	,,
Distance from lens to original	30	- ,,

Extra focal distance One focal length	1½ 6	ins.
Distance from lens to plate	71	

At the risk of making the calculation appear formidable the stages are set out as above, in order to show that the process is one which can be carried out in the head, without reference to tables or memoranda, once the simple relation between the scale of reduction, the focal length of the lens, and the extra focal distances has been grasped.

We can assume that the worker knows the focal length of his lens. The first thing, therefore, to be found is the ratio of reduction or enlargement desired for the particular work in hand. In every case this will be the ratio of linear reproduction. An enlargement of three times is one in which a length of 1 in. in the negative becomes 3 ins. in the enlargement. As regards area, this is a nine times enlargement, but calculations as to focal length cannot be done simply on such (area) ratios of reproduction. To discover the ratio to be used, we divide the long side of the plate into the long side of the original, and the result is the ratio. Thus in the case of a painting, say, 3 ft. × 2 ft., to be copied on a quarter-plate.

$$3 \text{ ft.} = 36 \text{ ins.}$$

 $36 \div 4 = 9$

-i.e., reduction number is 9.

It is well, as a rule, to take the length of the plate fairly under its actual measurement, in order to make sure of the copy falling clear within the space of the ground-glass. Therefore it is not necessary for practical purposes to use fractions of an inch when dividing the length of the original by that of the plate. Fractions also may be neglected in the case of ratios more than, say, 3. Thus it will be understood that it is an easy matter to work out this first stage of the calculation without paper and pencil.

CALCULATIONS WHEN COPYING.

When making a copy we multiply the focal length of the lens by the ratio—again done in the head—and add one focal length thereto. The result is the "object distance"—i.e., of lens from original.

To get the image distance—i.e., of plate from camera—we divide the focal length of the lens by the ratio of reduction and add 1 focal length. In practice there is usually no occasion to perform this operation, because when we have placed the camera at the correct object distance from the original all that remains to be done is to focus the image sharp. If, for focusing, the back, not the front, of the camera is moved, the scale of reproduction is not altered at all; it is that fixed by the position of the camera. But if the lens is moved in order to obtain shamp focus the scale of reproduction is altered. The alteration is not much when an

original is being reduced considerably—say, to a quarter its width or to less—but is very considerable indeed when there is not much reduction. In such cases it is indispensable for rapid work to use a camera in which focusing can be done by moving the back, the

lens remaining stationary.

When copying direct in the camera on an enlarged scale, the most convenient method is to make the calculation as though we were enlarging in the ordinary way in a lantern. We decide what the ratio of enlargement is to be—say, 2, 2½, or 2½ times, etc.—and multiply the focal length of the lens by this ratio. Add to the result 1 focal length, and we get the image distance from lens to plate. The camera is then moved up towards the original until the latter is in sharp focus. This is the most accurate and expeditious method of securing a given scale of (enlarged) reproduction. Theoretically, the final adjustment of focus should be done by moving the original to and from the lens, but it will usually serve every purpose to use the rack and pinion of the lens or of the camera front after the best possible focus has been secured by moving the camera as a whole towards or away from the original. We are, of course, speaking here of the use of a camera on a copying board on which both it and the original can be moved in alignment with the axis of the lens.

Example.—A print 4×3 ins. to be enlarged to 12×10 ins. plate

with a 7-in. lens:-

Ratio of Enlargement, 3.

. To find image distance:

E.F.D. (image) = 7 ins. \times 3 = 21 ins. Adding 1 focal length 7 ins.

Distance from lens to plate 28 ins.

To find object distance:

E.F.D. (object) = 7 ins. \div 3 = $2\frac{1}{3}$ ins. Adding 1 focal length 7 ins.

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From this it will be seen why it is better to set the camera extension by measurement, and to focus by moving first the camera and then, very slightly, the lens. The true "depth of focus" in the case of the much narrower angle of rays which reaches the plate is much greater than that on the other side of the lens. That is to say, we have to move the plate much more to obtain an appreciable alteration in focus than we have to move the original from the lens (or vice versa) to obtain the same difference, just as it is easier to focus with a lens of short focus than with one of long focus.

* * * * *

The "extra focal distance" method permits with equal readiness of other problems being worked out in the head. Suppose, for

example, we have to pheriograph an object from a point some distance off, and cannot approach nearer. We require the image a certain size, and want to know what focus of lens is necessary. The simple rule that a reduction figure of, say, 5 means an "extra focal distance" of 5 times the focal length of the lens may be used here, not quite exactly, but near enough for practical purposes. For example, we have a mural tablet 3 ft. in diameter, which on account of its height has to be photographed from an upper window on the other side of a 30 ft. roadway. We want the tablet, say, 5 ins. on the negative. Here our scale of reduction is 36 ins. (3 ft.) divided by 5 = say, 7. The distance (30 ft.) is our "extra focal distance" plus the focal length of lens to be used. As we know that the E F D is equal to the focal length multiplied by the reduction number—that is, it equals 7 focal lengths—the whole distance of 30 ft. is equal to 8 focal lengths, so that by dividing 30 ft. by 8 we get the focal length which is necessary.

30 ft. = 360 ins. $360 \div 8 = 45 \text{ ins.}$

As a lens of such focus is not likely to be available, it is evident we must be content with a smaller size of image or use a telephoto attachment. The latter, of course, will readily surmount a problem such as this, but we may use the conditions above mentioned to illustrate another variety of problem occurring in practical work, and similarly susceptible to ready calculation.

* * * *

To calculate size of given object in photograph taken at given

distance with lens of given focal length.

In the preceding case we have an object 36 ins. in width 30 ft. away. Supposing that our longest focus lens is 20 ins., what size image shall we get? Our "extra focal distance" is 30 ft. (360 ins.) less 20 ins. = 340 ins. Since this E.F.D. is made up by the focal length of lens multiplied by the reduction figure, the latter is equal to the E.F.D. divided by the focal length. That is, dividing 340 by 20 we get the scale of reduction—

$$340 \div 20 = 17.$$

In other words, the image will be 1-17th the original, so that our 3 ft. tablet will be 2 4-17 or 24 ins. in width in the negative.

A METHOD OF MEASURING THE FOCAL LENGTH OF THE LENS.

Before passing to the use of the E.F.D. in studio calculations, reference may be made to a ready method of finding the focal length of a lens which requires no apparatus beyond a camera and a rule. It depends on forming an image of as large a distant object as possible in the camera, measuring

- 1, the distance of the object;
- 2, the scale of reduction;

and from these two calculating the focal length of the lens. A commonly advised form of this method is to copy an object same

size, and then to divide the distance from plate to original by 4 to get the focal length of the lens. The exact adjustment to same size is not easy owing to the depth of focus when copying same size. It is more accurate to copy a very large distant object, disregarding the exact scale of reduction, and then calculate the focal length by the following rule*:—

Ascertain the distance from focussing screen to object in inches, multiply this by the reduction number, and divide the product twice by the reduction number increased by 1.

Thus, if total distance is 43 ft. and the degree of reduction 50, the calculation will be

11 inches (very nearly).

The chief essential to accuracy in this method is to get as long an image distance as possible to measure, therefore it is well to mark two fine lines in the ground glass as far apart as possible.

The distance between these two lines forms the image. The object is caused to conform to it by making it of two white rods or cords placed say 40 or 50 ft. from the lens and at such distance apart that their images fall on the marks on the ground glass. It is only then necessary to measure the distance between the two rods, and to divide by the distance between the marks on the ground glass.

STUDIO CALCULATIONS.

It is not too much to say that the majority of photographers whose work is limited to portraiture in the studio feel altogether at sea as soon as any kind of a calculation as to lenses has to be solved. Their first refuge is probably to some volume containing tables in

E.F.D. (object) + E.F.D. (image) + 2F. E.F.D. object = $r \times F$.

E.F.D. image = $1/r \times F$.

where F. is the focal length to be found and r the ratio of reduction, Th refere total distance from object to plate is F (r + 1/r + 2).

 $F \ = \frac{\text{distance of focussing screen from object, } \times r}{(r+1) \, (r+1).}$

^{*} The basis for the arithmetical rule is as follows: The distance from plate to object is made up of

which the information can be found without thought on the part of the inquirer. It can be shown, however, that the studio lens-calculations of which photographers have need are of a kind which can readily be done in the head or on Mr. Balfour's proverbial "halfsheet of notepaper."

Studio calculations naturally relate to the focal lengths of lenses which can be used, to the dimensions of studios and such like—in every case with reference to the portraiture of customers. This last condition simplifies matters. Our subjects do not vary very greatly in size, and we shall not be far out in assuming the height of the two most usual subjects in the studio to be as follows:

Full-length figure, height	68	ins.
Head and shoulders, height	30	ins.

Two further fixed positions which come into all studio calculations are the spaces which must be provided behind the sitter for the background and behind the camera for the operator. These may be put down as follows:—

	camera (operator)		
		_	 ft.

This means that whatever length of studio we may arrive at for a given kind of work, we must not forget that 6 ft. must be added on, and, vice versa, in calculating what lens we can contrive to use in a studio of given size one must start by subtracting 6 ft. and take the remainder as the distance available for the action of the lens.

With these provisions we can take a look at the method of doing any necessary lens-sum in the studio.

* * * * *

So far as concerns the action of the lens, portraiture is merely a form of reproduction on a reduced scale, and follows just the same rule as copying a picture—that is to say, the "extra focal distance" of the subject is equal to the focal length of the lens multiplied by the degree of reduction. Studio portraiture being done on plates of certain particular sizes, the reduction does not vary very much. Thus, in the case of a cabinet $(6 \times 4\frac{1}{4})$ print, the figure will usually measure 5 ins. on it, so that the degrees of reduction in the cases of a full-length figure and head and shoulders will be:—

Full length	$68 \div 5 = 13$ (nearly).
Head and shoulders	$30 \div 5 = 6$

In the case of C.D.V. portraits the degree of reduction is, of course, greater; in the case of Boudoir or Imperial portraits it is less, the reduction figures being obtained in each case by dividing the height of the actual subject by the height of the image. The

reduction figures of the most common sizes of photographs are thus as follows:—

TABLE A.

Name and Size of Photograph.	C. de V.	Cabinet.	Boudoir.*	Imperial.
Height of image on photograph	3	5	71/2	9
For full-length portrait, reduction figure is For head and shoulders portrait, reduction	23	13	9	71/2
figure is	10	6	4	3 nearly

* $8\frac{1}{2} \times 5\frac{1}{8}$. + 10 × $6\frac{7}{8}$.

These figures are not so numerous but what they may be kept in mind for studio calculations, but in any case they, or others for particular requirements, are at once arrived at by dividing, as already directed, the height of the image into that of the subject.

* * * * *

To take first one of the most frequent questions put by those who distrust their ability to perform lens calucations:—Will a studio of given length, say 20 ft., allow of a certain class of work, say, full-length cabinet figures, being done with the ordinary cabinet lens, e.g., the Dallmeyer No. 3 B of $11\frac{1}{2}$ ins. focal length. In this case we are copying on a scale of 1/13th—that is, our reduction figure is 13. Therefore we know that the E.F.D. in front of the lens is $11\frac{1}{2}\times13$; that behind the lens is $13\div11\frac{1}{2}$. As in all our other calculations, we must not forget the focal length on either side of the lens, in this case $11\frac{1}{2}\times2$, and to this sum we add the 6 ft. allowance for background and operator. Jotted down on an envelope, the calculation is :—

E.F.D. (object)	150 :	ins.
E.F.D. (image), say	1 in	1.
Two focal lengths	23	ins.
Working space (6 ft.)	72	ins.
· ·	246	Dis.

Necessary working length in studio = 20 ft. 6 ins. That is to say, 20 ft. will just suffice.

* * * * *

In such calculation as this one must remember that the total necessary length in the studio is composed of four parts:—

- 1. E.F.D. object (before lens) = focal length × reduction figure.
- 2. E.F.D. image (behind lens) = focal length + reduction figure.
- 3. Space of one focal length in front of and behind lens = focal length \times 2.

4. Convenient working space, say, 3 ft., behind sitter, and same space behind camera. = 6 ft.

The total of these figures gives the wall-to-wall length of the studio.

* * * *

It will help us to remember if we look at the same kind of problem another way. Using a lens of 10 ins. focus in a studio 18 ft. long, what degree of reduction is possible? That is, what descriptions of portraiture in the above table, A, can be done?

Length of studio, 18 x 12 Subtracting working space	ins. 216 72
Subtracting two focal lengths	144 20
	124

This distance (124 ins.) is composed of both the front and back E.F.D.'s. We could find the exact value of the reduction figure corresponding to the focal length of 10 ins. by making allowance for this fact, but as the back, or image, E.F.D. is so small, it is near enough to reckon 124 as being the front, or object, E.F.D., and then, as we know, the reduction figure is this length divided by the focal length of the lens—i.e.,

$$124 \div 10 = 12\frac{1}{2}$$

which shows us that the greatest reduction we can get is not quite enough for full length cabinet figures.

* * * *

To put the same species of problem in still a third way, suppose that in a studio 35 ft. in length we wish to make midget photographs of head and shoulder portraits, and have only a lens of 12 ins. focal length. We want to know if the length of the studio will allow of this being done. Here we can find either the length of studio necessary when using a lens of 12 ins. focus, or the maximum focus of lens allowable when working in a studio of 35 ft. We will do the latter:—

First calculating the degree of reduction, we divide the height of the sitter (head and shoulders = 30 ins.) by the height of the image on the midget print (say, 2 ins., or a reduction of 15).—

From the total length of the studio (35 ft.) = 420 ins.

We subtract for working space of = 72 ins.

348 ins.

This remaining length is made up, as we have learnt, of:— Two focal lengths = focal length × 2, Object E.F.D. = focal length x reduction number.

= focal length \times 15.

Image E.F.D. = focal length ÷ by reduction number. = 1/15th of the focal length.

This last is so small in comparison with the whole length of 348 ins. of which it forms part that the result will not be affected appreciably by leaving it out. We then see that the two components of the distance (348 ins.) are:—

2 focal lengths 15 focal lengths

17 focal lengths

Dividing 348 by 17, we get $20\frac{1}{2}$ ins. = the focal length. That is, we can use lenses up to this focus quite well, so that there is ample space for using that of 12 ins.

ENLARGING.

The calculations as to enlarging are very simple when worked on the E.F.D. system. Here, as in the studio, the space between the negative and the enlarging easel may be divided into three parts, viz.:—

- 1. One focal length of lens in front of and one behind the lens = focal length × 2.
- 2. Image E.F.D. (lens to easel less 1 focal length) = focal length \times enlargement figure.
- 3. Object E.F.D. (lens to negative less 1 focal length) = focal length ÷ enlargement figure.

Thus, in the case of enlarging from 4×3 to 12×10 , the enlargement figure or ratio is 3. Using a 6-in. lens, the component distances 1, 2, and 3 above-mentioned will be:—

1. $6 \times 2 = 12$ ins. 2. $6 \times 3 = 18$ ins. 3. $6 \div 3 = 2$ ins.

32 ins.

From which we see that, for an enlargement of 3, the distance erner side of the lens is 8 ins. towards the negative and 24 towards the easel, these being obtained, as before, by adding the focal length to the respective E.F.D.'s. We believe that the reader will not need examples of the application of the rules, already given in different forms, for working out calculations, such as the distance from lens to easel for given enlargement with given lens, etc.

EPITOME OF PROGRESS.

BY THE EDITOR.

In the following pages will be found classified abstracts of papers, communications, and articles describing progress in technical photography (art topics are excluded) which have appeared in the British and foreign Press during the twelve months Oct. 20, 1908, to Oct. 20, 1909. It may have happened that some foreign journals have not arrived in time for abstraction; their contents will be dealt with in the 1911 "Almanac."

The general arrangement of the Epitome will be seen from the contents of the "Almanac," which follows the title-page. Each item is separately entered in the index at the end of the volume, and a list of the journals abstracted will be found at the conclusion

of the Epitome.

In a number of cases where information additional to that in the abstract has appeared in the "British Journal of Photography" a reference to issue and page has been given.

I.—GENERAL.

EVENTS OF THE YEAR.

1909.

Jan. 1 to 9.—Sixth Scottish Salon. Held at Wishaw. ("B.J.," Jan. 8, 1909, p. 26.)

Jan. 6 to 27.—Northern Photographic Exhibition, held at Manchester. ("B.J.," Jan. 8, 1909, p. 24.)

Jan. 8 to Feb. 20.—Exhibition of "Scenes and figures of the Sicilian Coast" by W. von Gloeden at the house of the "B.J." ("B.J.," Jan. 15, 1909, p. 48.)

Jan. 12 to March 3.—Exhibition of portraiture by R. Dührkoop at the Royal Photographic Society. ("B.J.," Jan. 15, 1909, p. 48.)

Feb. 9.—Award of the Progress Medal of the Royal Photographic Society to MM. Lumière et ses Fils "for the Autochrome process of colour photography and for their photo-chemical researches." ("B.J.,"

Feb. 12, 1909, p. 115.) A paper on the researches of MM. Lumière in photography and on the history of their firm by Major-General J. Waterhouse appears in "Phot. Journ." March, 1909, p. 143.

March 3.—Exhibition of "A series of impressions rendered by photography" by Malcolm Arbuthnot at the offices of "The Amateur Photographer." ("B.J.," March 12, 1909, p. 200.)

March 9 to April 10.—Exhibition of photographs by members of the Affiliation of the R.P.S. ("B.J.," March 19, 1909, p. 220.)

April 29 to May 17. Salon of the Paris Photo-Club, held at the Cercle Volney. A review by M. Demachy appears in "B.J." June 4, 1909, p. 435.

Dresden International Exhibition, held from May to October, 1909. General review appears in "B.J.," May 21, p. 396; scientific sections. "B.J.," May 28, p. 417 and June 4, p. 437; professional photography, "B.J.," June 11, p. 453; amateur photography, "B.J.," June 18, p. 471; photographic trade, "B.J." June 25, p. 496; schools of photography and Austrian exhibits, "B.J.," July 2, 1909, p. 514.

May 4 to June 8.—Exhibition of photographs in the bromoil process by F. J. Mortimer at the Royal Photographic Society. ("B.J.,"

May 7, 1909, p. 365.)

May 19 to July 31.—Exhibits of portraits of "Fair Children" (of Royal and titled personages) by Richard Speaight, held at the galleries of Messrs. Speaight, Ltd., 157, New Bond Street, London. "B.J.," May 21, p. 403, and July 16, p. 558, 1909.)

May 28 to June 2.—Congress of Applied Chemistry, held in London. The photo-chemical section met under the presidency of Sir William Abney. A report of the proceedings appears in "B.J.," June 4, 1909. p. 439.

July to August.—Exhibition of photographs by Colonial readers of the "Amateur Photographer." Held at 52, Long Acre, London, ("B.J.," July 16, 1909, p. 558.)

July 5 to 10.—Twenty-fourth meeting of the Photographic Convention of the United Kingdom, held at Canterbury under the presidency of H. Snowden Ward. The proceedings are reported in the "B.J.," July 9, p. 530, and July 16, p. 549, 1909. The 1910 meeting will be at Scarboro' under the presidency of Mr. Godfrey Bingley.

July 19 to 24.—Convention of the Photographers' Association of America, held at Rochester, New York State, and attended by close on 1,800 photographers. A feature of the Convention was the visit to Kodak Park, and the hospitality of Mr. George Eastman and the Board of the Eastman Kodak Co. ("B.J.," August 13, 1909, p. 623.)

September 10 to October 23.—Seventeenth Photographic Salon held at 5A, Pall Mall East. The Selecting Committee were:—J. Craig Annan, Frederick H. Evans, Walter Benington, F. J. Mortimer, George Davison, J. Dudley Johnston, M. Arbuthnot, and Reginald Craigie (ex officio). ("B.J.," September 10, p. 699, and September 17, p. 720,1909.)

September 23 to October 30.—Fifty-fourth exhibition of the Royal Photographic Society. ("B.J.," September 24, 1909.) Selecting and

Hanging Committees:—Pictorial section: A. H. Blake, Harold Holcroft, E. T. Holding, F. T. Hollyer, Charles F. Inston, Arthur Marshall, and F. J. Mortimer. Technical section: F. Cheshire, F. R.M.S., W. Farren, Douglas English, B.A., Dr. C. Thurstan Holland, C. E. K. Mees, D. Sc., and Major-General J. Waterhouse, I.A. Colour photography section: Ernest Marriage, F. Martin Duncan, and James A. Sinclair.

November 23—Twelfth Traill-Taylor Memorial Lecture. "The Growth of the Photographic Image." By Professor A. W. Porter, B.Sc., F.R.A.S. (Announcement.)

COPYRIGHT.

Copyright in New Zealand.—Complaints are made that the Registrar of Copyrights in the Dominion reads the New Zealand Fine Arts Copyright Act of 1877 to require compulsory prepayment of the fees for both registration and a certificate of the fact (amounting to 7s. 6d.) before registration can be effected.—"N.Z. Phot.," Mar., 1909, p. 3; "B.J.," May 7, 1909, p. 359.

Copyright in America.—Much disappointment is felt that in the Copyright Act which became law in the U.S.A. on July 1 last photographers are singled out for a lesser degree of protection in their dealings with newspapers than is the case with other illustrators. In the case of photographs damages obtainable in an action for infringement shall not exceed the sum of 200 dollars nor be less than 50 dollars. This is an exception to the general ruling that damages shall not exceed 5,000 dollars nor be less than 250 dollars.—"Bull. Phot.," Mar. 3, 1909, p. 137; "B.J.," May 7, 1909, p. 360.

Proposed Changes in Copyright Law.—The full text of the revised draft of the Copyright Bill drawn up by the Artistic Copyright Society is printed in "B.J.," Jan. 15, 1909, p. 44. From an editorial article dealing with the provisions of the Bill of special importance to photographers it is seen that under the proposed Act British subjects will have copyright throughout the British Dominions in all their works, whilst foreigners have copyright within the British Dominions. It is proposed that copyright in photographs shall last for a term of thirty years after the expiration of the year in which the work was completed. In the absence of a form or agreement in writing, the copyright in any work remains with the author, except in the case of a work of fine art, which is a portrait, and of a photograph made to order for a consideration, in both which cases the copyright belongs to the person giving the order upon

payment of a consideration. Photographs marked c. do not require to be registered, but may still be registered, in which case the mark is R.C. A reduction is made in the registration fee when

a number of copyrights are registered at the same time. In the case of a photographer whose assistant takes a photograph the employer is to be considered the author.—"B.J.," Jan. 15, 1909, p. 38.

BUSINESS.

Fraudulent Supply of Photographs.—A case of considerable importance to the photographic profession was heard at Southampton Police Court on July 29, 1909. Mr. S. G. Kimber, F.R.P.S., summoned a firm of photographers in reference to the supply of silver prints as carbon photographs. Defendants pleaded guilty, and were fined 10s. and costs. The case should apply a check to the fraudulent supply of the cheaper class of photographic print in place of carbons or platinotypes. It is to be hoped, too, that the case will remind manufacturers of the opportunity for fraud on the part of the less reputable photographers created by the lack of sufficient explicitness in descriptive terms applied to printing papers other than those for the carbon and platinum processes.—"B.J.," Aug. 6, 1909, p. 605.

Amalgamation of German Camera Makers.—A combination consisting of the firms of Hüttig and Sohn, of Heinrich Ernemann, and of Emil Wünsche and Co., all of Dresden, the firm of Dr. R. Krügener, of Frankfort, and the camera department of Carl Zeiss, Jena, has been formed during the past summer (1909), with a capital of 4,000,000 marks.

Photography in British Columbia.—L. Haweis, in two articles, the first of which appears in the Colonial and Foreign number of the "B.J.," discusses the conditions under which photographic trade must be obtained in British Columbia.—"B.J.," Mar. 26, 1909, p. 233, and Apr. 2, p. 263.

Photography in Japan.—T. B. Blow, in the Colonial and Foreign number of the "B.J.," gives an account of present-day conditions in Japan as regards professional photography and photographic manufacture.—"B.J.," Mar. 26, 1909, p. 236.

EDUCATION.

Photographic Training of Girls.—An account is given in "B.J.," Dec. 11, 1908, p. 940, of the L.C.C. School in Vincent Square, London, S.W., where, among other subjects, instruction is given to girls in photographic trade work.

II.—APPARATUS AND EQUIPMENT.

(Including Raw Materials Used in Photography).

The many details of pieces of apparatus published chiefly in patent specifications are not abstracted in this "Epitome," as space does not permit of the numerous drawings necessary for their explanation. All patent specifications are abstracted in the "British Journal of Photography," and are entered according to subject and also under the name of the patentees in the index to the yearly volume of that publication, which is issued with the last number of the year or the first of the year following.

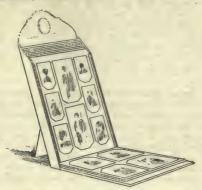
Dark Room and Studio.

Repairing Dishes, etc.—G. W. Webster recommends for the repair of porcelain dishes, glass measures, etc., the "Cementium" cement made by the Cementium Patent Company, Limited, Tanner Street, Bermondsey, S.E. It would appear to be a preparation of waterglass and silica, but it forms a solid joint, serving for the mending of almost any material except indiarubber, vulcanite, and celluloid.—"B.J.," June 11, 1909, p. 456.

Studio Mirror Accessory.—A. Iser has patented the use of a sheet of clear glass which is placed in a darkened portion of the studio at an angle of 45 deg. to the opening of this darkened chamber. The camera is placed to one side of the chamber, the axis of the lens being at an angle of 45 deg. to the mirror. The operator thus photographs the reflection of the sitter in the transparent mirror, whilst the sitter is able to view himself in the mirror, and cannot see the camera or the movements of the operator.—Eng. Pat., No. 5,763, 1909; "B.J.," June 25, 1909, p. 502.

Exhibiting Photographs in the Reception Room.—A novel form of portfolio for holding and exhibiting photographs in the studio was shown by Oswald Weisser at the Dresden Exhibition. The portfolio is made with an open hinged front, and contains a series of mounts each taking seven or eight photographs, which mounts are similarly

hinged to the bottom of the case. The latter stands of itself on a table, and the series of mounts can be turned down one after the

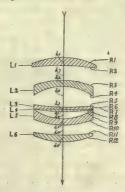


other when showing prints to a visitor, both sides of each mount being available for the purpose.

Lenses and Photographic Optics.

The Regulation of the Rays in Photographic Objectives.—The Traill-Taylor lecture delivered by Dr. E. Wandersleb on this subject does not admit of condensation.—"Phot. Journ.," Jan., 1909, p. 4, and "B.J.," Feb. 15, p. 116, and Feb. 19, p. 139, 1909.

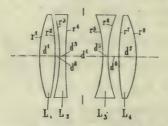
Five-Lens Anastigmat.—Conrad Beck and Horace C. Beck have further patented an improvement in the "Isostigmar" pattern of



lens ("B.J.A.," 1908. p. 590), allowing of a larger aperture being obtained while still providing the corrections for astigmatism,

spherical aberration, chromatism, and coma. The general form of the lens is retained, but as shown in the drawing there is used, instead of the lens L2, a pair of lenses which may be cemented together, one element consisting of a negative lens of high dispersion and the other of a positive lens of low dispersion. By this means a lens is made with an aperture of approximately f/4, which will give good definition practically free from astigmatism over an angle of about 60 deg.—Eng. Pat., No. 14,673, 1908; "B.J.," Aug. 13, 1909, p. 634.

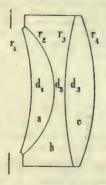
Four-Lens Anastigmat.—C. P. Goerz, A.G., has patented a construction of a four-lens objective composed of two pairs of lenses, each comprising a positive and negative lens, leaving between them an air-space in the form of a positive meniscus. In order to produce at a large aperture a high degree of correction, particularly of coma and spherical aberration, the refractive power of the negative lens in each of the two pairs of lenses is made smaller or equal to the refractive power of the positive lens in the pairs of lenses respectively, and at the same time the focal length of one-half of



the objective formed by one pair of lenses is made at least twice as great as the focal length of the other half. By such construction of the objective from two halves, each of which exhibits, if examined for itself alone, considerable errors, it becomes possible to compensate the errors of the two halves, and to obtain an objective of increased perfection compared with that of Eng. Pat., No. 12,859, of 1898, in which the ratio of the focal lengths of the two halves is unity, and the halves are corrected spherically, astigmatically, and chromatically. According to the figures for radii thicknesses and kinds of glass, a relative aperture of f/3.5 is to be obtained.—Eng. Pat., No. 13,901, 1908; "B.J.," Jan. 1, 1909, p. 9.

Three-Lens Anastigmat.—The C. P. Goerz Company and W. Zschokke have patented an anastigmat consisting of a negative lens between, and in contact with, a biconvex lens of low dispersive power on one side and a positive meniscus on the other side, having lower dispersive and refractive power than the biconvex lens. The biconvex lens is formed of a kind of glass which has a higher refractive power than hitherto used, such refractive power resulting in a refractive index, n D, of at least 1.615.

The effect obtained by this increased refractive power is due to the fact that the curvature of the contact surface between the negative lens of the objective and the biconvex lens is reduced in consequence of the increased difference between the values of the refractive indices of the negative and the biconvex lenses. The advantage of the reduction of the curvature of the contact surface is that the astigmatic aberration, if eliminated for a certain inclination of rays entering the objective, is at the same time eliminated to a higher degree for varying inclinations of rays than in the case of greater curvature of the contact surface of the negative and the biconvex lenses, as is found in construction described in Eng. Pats., No. 3,041, 1899, and No. 29,447, 1906.



An objective, in accordance with the invention, is represented in the drawing, where the three lenses forming the objective are designated a, b, and c respectively. The thicknesses of the three lenses are designated d_1 , d_2 , d_3 respectively, and the radii of curvature of the four lens surfaces are designated r_1 , r_2 , r_3 , r_4 respectively.

The constructional elements of two embodiments of the new objective for a focal length 100 mm. are given in the following

tables :---

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Radii.
                    Thicknesses.
                                            Kinds of glass.
r_1 = -12,289 \text{ mm}.
r_2 = -4,989 ,, d_1 = 1.343
                                   n_{\rm D} = 1.5102n_{\rm G1} = 1.5202 \ v = 64.1
r_8 = +22,111 ,, d_2 = 0.584
                                   v_{v} = 1.5477, v_{v} = 1.5609 v_{v} = 53.3
r_4 = -12,174
                 d_8 = 1.751
                                       = 1.6169 ,,
                                                     = 1.6316 v = 53.8
r_1 = -13,889
r_2 = -6,250
                 d_1 = 2.0
                                       = 1.4649 ,,
                                                      = 1.4738 v = 65.6
r_3 = -38,911 ,, d_2 = 0.8 

r_4 = -14,117 ,, d_3 = 2.1
                                   v_{v} = 1.5164 \, v_{v} = 1.5286 \, v_{v} = 54.1 \, v_{v}
                                       = 1.6210, = 1.6349 v = 57.1
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The improved objective can be used either as a single lens or as a doublet.—Eng. Pat., No. 13,902, 1908; "B.J.," Jan. 29, 1909, p. 87

"Magnifiers" on the Telephoto System .- Dr. H. Harting has suggested the use of a very low-power telephoto lens (positive and negative lenses of equal focal length) to serve as an attachment for the front of an ordinary lens whereby objects at different distances may be brought into sharp focus without altering the extension of the camera. The attachment amounts to the provision of a whole series of "magnifiers" by simply altering the separation between the negative and positive of the attachment, the focal lengths thus produced being equal to the distances of the object photographed. The whole attachment may be fitted in a mount of the focussing type, care being taken that the mount is of such dimensions that it does not act as a stop and lead to vignetting of the image. It is readily seen that cameras, such as those made for stereoscopic photography, for a plate of 107 x 45 mm., may be fitted with a pair of these focussing lenses, so that even when lenses of large aperture are employed focussing may be done for the foreground or distance. For fitting to reflex cameras also it may be preferable in the case of a large lens to mount the latter in a fixed position, with its weight balanced on the camera front, and to provide focussing by means of the above-described attachment. The advantage of the suggested device lies in the fact that the same combination of lenses may be used for any objective, of whatever focal length, so long as the respective diameters are suited to each other. Also, in the case of lenses which already are fitted in a focussing mount, the use of the attachment allows of objects still closer to the camera being brought into sharp focus.-" Phot. Rund.," Heft. 12, 1909, p. 141; "B.J.," June 25, 1909, p. 492.

TELEPHOTO LENSES.

Commercial Telephoto Work.—E. A. Biermann has shown the advantage of a telephoto lens in making a series of photographs of houses on a certain estate which was being offered for sale. Owing to the undulating nature of the ground the natural picturesque surroundings of the houses could not be shown when a near standpoint was taken, as required by a lens of the normal focal length, but by taking a more distant view-point a greatly improved aspect was obtained, and the two illustrations reproduced make the strongest possible case for the inclusion of a telephoto lens in the equipment of the photographer who would go out prepared to make the very best of a commission of this kind.—"T.Q.," June, 1909, p. 11; "B.J.," July 16, 1909, p. 546.

Practical Telephoto Work.—Captain Owen Wheeler, editor of the "Telephoto Quarterly," in a paper before the R.P.S., referred to the advantage of retaining one or two (moderate) camera extensions and obtaining different magnification by a series of negative elements. Thus, with extension up to 15 ins., a series of negatives of 2\frac{2}{4}, 2\frac{1}{4}, 1\frac{3}{4}, and 1\frac{1}{6} ins. gives magnifications from 5\frac{3}{4} to 14. Captain Wheeler, among other hints, advised the use of a long hood to the lens, and the use of a yellow screen for cutting out atmospheric haze.

In the discussion of the paper Mr. Edgar Clifton described a device of his for indicating the magnification being given by a

telephoto lens. A piece of white tape or of ribbon that will not stretch is taken, a ring sewn at the end of it so as to fit over any convenient screw in front of the camera, and, after finding out how far the negative projects into the camera, a series of divisions is marked off from that point, each of them equal to the focal length of the negative attachment. It is convenient to begin at twice the focal length of the negative lens. If, for example, the tape attached to the camera front shows the magnification to be three while the stop is f/11 we arrive at once at the working aperture of f/33. The most certain method of focusing is by means of the pinion on negative attachment. If we focus by the separation of the negative and positive elements we hit the right point in the most unmistakable manner. On the other hand, if the rack of the camera be employed, the depth of focus is such that one is never certain whether or not the best focus is obtained. An important use of the telephoto lens, added Mr. Clifton, is in making same size or nearly same size photographs of small objects. When an ordinary lens is used it has to be so near that the object is shown in bad drawing; with a telephoto a more distant standpoint can be taken and the object photographed in proper perspective.—" Phot. Journ.," July, 1909, p. 295.

Telephoto Lantern Lens.-K. Martin calls attention to the advantages of the telephoto construction in lantern work. In any lens made on the principle of the telephoto the nodes are some way outside the objective on the side of the positive combination. therefore, we use such a construction in place of the ordinary lantern lens, and with the positive element nearest the condenser, a much greater distance is required between the condenser and pro-This means that the light must be brought nearer the condenser to obtain even illumination, and this involves a consequent gain in light. This is one of the advantages of using a longfocus projector, which many workers fail to realise. Long-focus ordinary lenses have, however, the disadvantage of increasing the distance between lantern and screen. This trouble is got over if we use a short-focus lens of telephoto construction, with which the distance from slide to screen is not much greater than with an ordinary lens of the same focal length.-Eder's "Jahrbuch," 1908, p. 46; "B.J.," Jan. 22, 1909, p. 58.

Telephoto Lens-Mount.—Capt. Owen Wheeler has patented the method of mounting the positive and negative elements of a telephoto lens in a way which dispenses with a solid tube between the two, and thus reduces internal reflections. The negative element uscarried at the end of a light removable framework built of a number (usually three or four) of strong metal wires or rods projecting into the camera from the inside of the front panel or from the mount of the positive element. The positive lens mount is of the focusing type, actuated preferably by a small lever arm and screw movement to vary the separation of the two elements according to the magnification required and to the camera extension.—Eng. Pat., No. 20,415, 1908; "B.J.," Aug. 6, 1909, p. 614.

Cameras and Accessories.

Use of the Small Camera.—H. E. Corke comments on the advantage which can be taken of a small pocket camera (the focussing scale of which does not extend beyond about 6ft.) by using the instrument on a tripod and with the smallest stop in the lens. In this way objects much nearer to the camera than the shortest distance provided by the focussing scale may be satisfactorily copied and distant objects obtained on a larger scale by using the camera at its full extension and stopping down the lens. The illustrations show the practicable character of these suggestions.—"A.P.," June 8, 1909, p. 546.

A Clamp for Turntable Cameras.—When fixing a camera of the turntable pattern to a baseboard for copying purposes, the simplest and most efficient mode of attachment is by means of a flat brass bar long enough to fit over the baseboard of the camera, under the bellows, and in the centre of it riveted a screw boss to take a camera screw. The bar is only long enough to rest on the upper edges of the turntable ring, while the underside of the boss is nearly flush with the bottom of the turntable. The camera is put upon the support arranged to receive it. The bar is dropped in over the turntable, and then a camera screw passed through the support and screwed tightly into the boss holds everything as firm as can be wished. The contrivance fulfils its purpose perfectly, and can be carried about quite easily in the pocket.—"B.J.," June 11, 1909, p. 450.

REFLEX CAMERAS.

Reflex Cameras.—No. 99 of "The Photo-Miniature" is devoted to the advisable features of reflex cameras, the methods of reflex photography, and the movements of existing patterns of reflex camera.—(See also "B.J.A.," 1909, pp. 526 to 542.)

Folding Reflex Camera.—A patented form of folding reflex, according to the specification of J. Frennet, is described in "B.J.," Sept. 10, 1909, p. 709.

Types of Reflex Camera.—Reflex cameras may be divided into two classes:—(a) those in which the mirror rises by a spring on the shutter release being pressed, the shutter being at the same time released and the mirror remaining up after the exposure; and (b) those in which the mirror is raised by hand into the up position when continued pressure on the lever actuates the shutter. The mirror then falls again by its own weight. Instruments of pattern a have the advantage that the camera can be used upside down when held above the head in photographing when there are obstacles in front. The release is also more smoothly made in this pattern, and there is the further advantage that the interval between pressure on the release and exposure of the plate is constant, as it depends on the mechanism of the camera and not on the

quickness with which the release is pressed. The drawback to the a pattern is that the plate is left covered only by the blind of the shutter, and, if the latter is not a self-capping one or is not automatically locked until the mirror is put down, a plate may at times be accidentally fogged by re-winding the shutter before putting down the mirror.—"B.J.," June 11, 1909, p. 451.

Full-Size Focussing Cameras.—J. Gaut and Harrington and Company have patented a construction of camera in which the image is viewed on a white opaque surface placed slightly in front of the focal-plane, and viewed through an aperture or eye-piece in the front part of the camera. One single release raises this focussing screen, at the same time moves the lens backwards so as to bring the sensitive plate into the focal-plane and actuates the shutter. (Compare the patent of Thornton, "B.J.A.," 1909, p. 554.) Eng. Pat. No. 7,512, 1908.—"B.J.," Mar. 5, 1909, p. 181.

Stereoscopic Cameras and Accessories.—See under "Stereoscopic Photography" in section "Photographing Various Subjects."

INSTANTANEOUS SHUTTERS.

Testing Shutter Speeds.—E. A. Salt describes and gives constructional details of a very practical form of the shutter-measuring camera, in which an image of an illuminated slit is received on a

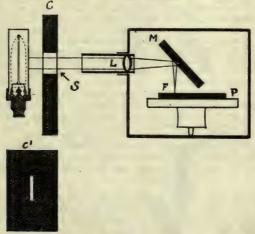


Fig. 1.

plate rotating at known speed. The apparatus records durations of exposure down to about 1/100th sec., and indicates the efficiency of the shutter tested. Fig. 1 is a diagram of the complete apparatus.

On the right is a light-tight box or camera, fitted with a lens, L, in sliding tube for focussing. On the left is seen, in side and front elevation, a board CC', behind which is an incandescent burner illuminating a slit, S. This illuminated slit is focussed on a dry plate, P, by means of a surface-silvered mirror, M, set at an angle of 45 deg. The dry-plate is supported on a carrier capable of rotation at definite speed. The shutter is placed in front of the slit. On the release of the shutter a point of light is first recorded on the rotating plate, F, broadening into a circular band representing full aperture, and tailing off again into a point on the completion of the exposure. By applying the developed plate to a homemade protractor on glass, secured by copying a drawing in the camera, the number of degrees covered can be read off, and deducting the width of the slit image the duration of exposure is ascertained. The efficiency of the shutter can be closely arrived at by noting the number of degrees occupied in opening and closing, and in the period of full aperture.

A special spring motor, sold by Messrs. George Adams and Company for driving gramophones, is used to rotate the plate, which is rigidly held in a carrier of simple design. At two revolutions per second (the speed adhered to) the motor runs with great accuracy. The mirror can be swung into a horizontal position to permit removal of the plate carrier underneath. The camera is divided horizontally into two compartments to prevent leakage of light, the mirror and plate-carrier occupying the upper part, the motor the lower. Both sides of the camera are removable. A dry-cell, the current from which passes through a contact fixed to the motor spindle, actuates a small magnet and armature, and gives an audible tap at each revolution. A pencil inserted through a guide allows of a circle being inscribed on the plate and of its being subsequently centred on the protractor. Several records, six or more, can be taken on one quarter-plate, according to the scale desired. The slit image is recorded on the plate when stationary, so that its width may be deducted from each reading. The camera and slitcarrier are provided with rising fronts, the amount of rise being indicated by scales. Speeds of half a second and longer can be recorded if necessary by slightly lowering the camera front when an exposure is being made. Provision is made for employing slits of varying lengths, the shutter being held close thereto by an adjustable carrier. The camera and slit-carrier are mounted on a baseboard, on which the former slides.

A reduced copy of the protractor used is shown in Fig 2. In order to avoid crowding it is divided into 125 divisions only. In practice each division is read as representing 4 degrees. With the motor revolving twice a second each degree will therefore indicate 1/1,000th sec.

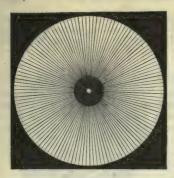
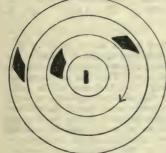


Fig. 2.







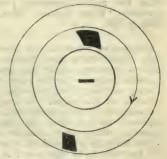


Fig. 5.

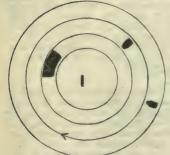


Fig. 6.



Fig. 7.

The foregoing are some typical diagrams of representative shutters on the market. In all the beginning of the curve representing the opening of the shutter points in the direction of rotation indicated by the arrow head, slow-speeds being taken towards the centre, and vice versa.

Fig. 3.—Iris shutter. No period of full opening at highest speed.

Fig. 4.—Messrs. Beck and Co.'s "Celverex" shutter. System diaphragmatic; spring tension constant; reduction of aperture in rotating disc, to obtain proportional variation in "durations."

Fig. 5.—Thornton-Pickard roller-blind shutter, 15 ins. One inch slit used.

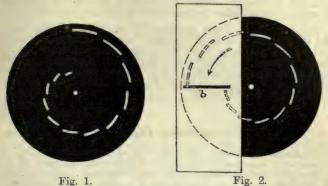
Fig. 6.—Messrs. A. E. Staley and Company's diaphragmatic (three-bladed) "Compound" shutter.

Fig. 7.—Messrs. Emil Busch and Company's before-lens "Fore-ground" shutter. A blade lifts and descends. The portions away from the centre represent proportional exposures to the fore-ground.—"Phot. Journ.," Mar., 1909, p. 170; "B.J.," Apr. 9, 1909, p. 282.

Diaphragm Shutters.—As mentioned in the above paper by Mr. Salt, while with a blind shutter a reduction of the stop leaves the efficient exposure exactly the same, with the iris shutter the efficient exposure increases as the stop is reduced. This has an important bearing on the use of the stops, though that fact may not be quite apparent at first sight. So long as the efficient exposure remains the same the stops preserve their ordinary value, but if the efficient exposure changes then the stops change their value as regards intensity. Suppose we consider the case of an iris shutter working at an efficiency of one-third when set to a high speed. Assume its full aperture to be equivalent to f/5. Then with a lens aperture of f/11 the efficiency is increased to two-thirds, or is doubled. In the ordinary way a reduction of aperture from f/5.6 to f/11reduces the intensity of the light to one-quarter, but as in this case it has doubled the shutter efficiency the light intensity is only halved. If this fact is not known it is certain that the photographer will assume that by opening out his lens stop from f/11 to f/8 he doubles the exposure, and probably not one in a hundred ever realises that it is necessary to open out to f/5.6.—"B.J.," Mar. 5. 1909, p. 174.

Measuring Shutter Speeds.—Paul Thieme has described a method of measuring shutter speeds by means of a rotating disc in which are a number of slits of different lengths cut concentrically in the disc, so that on the latter being rotated and viewed through a horizontal slit a series of successive equal light-impressions are obtained from a source of light placed behind the disc. This arrangement, which is shown in the two figures, allows of the apparatus being used both for diaphragm and focal-plane shutters.

The apparatus is adjustable to speeds of various degrees by increasing or reducing the speed of the disc.—"Phot. Mitt.," Heft.



9 and 12, 1909, pp. 133 and 180; "B.J.," May 21, p. 397, and June 25, p. 453, 1909.

Birkhauser's Apparatus.—A device, similar in principle to that of Thieme's above described, is used by Dr. R. Birkhauser, who employs for the revolution of the disc a weight attached to the pulley, so that on being allowed to fall it completely detaches itself from the pulley and leaves the disc rotating at a uniform rate. Drawings, showing the method of perforating the disc, and also specimen records obtained, are given in "B.J.," July 9, 1909, p. 535. The apparatus serves for measuring both diaphragm and focal-plane shutters, and also for recording the rapidity of combustion of flashlight powders.

Pneumatic Method of Measuring Diaphragm Shutters.—W. H. Smith has devised the following method:—T is a tube adjustable up and down, out of which a gentle current of air is flowing. B



is a thin board having the circular opening shown. M is a mica disc, attached to one end of the board by means of a flattened watch-spring, which has just sufficient force to allow the disc nor-

mally to close the opening. On the underpart of the disc, M, is fastened a small camel-hair brush, charged with aniline dye solution. S is a stop to limit the action of the disc. R is a drum rotating at known speed, around which is wound some white paper.

The shutter to be tested is placed over the aperture in the board, and the pipe brought down centrally. Air is turned on, either by blowing into the tube, or in any other convenient way, and the shutter released. The mica disc is instantly depressed, and the brush leaves a recording streak on the rotating paper indicating the duration of exposure.—"Phot. Journ.," Mar., 1909, p. 170; "B.J.," Apr. 9, 1909, p. 285.

Artificial Light.

Arc-Lamp Reflectors.—The reflectors of arc lamps are apt to become very discoloured after a time, and so the efficiency of the light is considerably impaired. To whitewash them, however, is not of much use, as the heat soon causes it to crack off, and most white paints are not very good, as they soon yellow badly. The best medium for this purpose is the "Olsina" white water paint sold by Messrs. Mander Bros., which, applied thinly after it has been reduced with water to a suitable consistency, withstands the heat and keeps its colour well.—"B.J.," Jan. 29, 1909, p. 86.

FLASHLIGHT.

Flash Powders.—Dr. G. Krebs has patented a non-explosive mixture, giving a flashlight with very little smoke, the basis being magnesium or aluminium powder, anhydrous copper sulphate or chrome alum: e.g., chrome alum and magnesium powder, equal parts; or copper sulphate, anhydrous, 6 parts; magnesium powder, 3 parts; aluminium powder, 1 part. This gives much less smoke than mixtures containing chlorate, and the smoke passes away rapidly, so as to allow of a series of successive exposures in a room.—Ger. Pat., No. 205,499, of July 26, 1904, from "Chem. Zeit.," Repertorium, No. 16, 1909, page 68; "B.J.," Feb. 12, 1909, p. 127.

Thorium Flash Powders.—Carl Bethge uses insoluble, or nearly insoluble, metallic salts of thoria in conjunction with magnesium or aluminium metals as a rapid or slow flash powder. The compounds of thoria with acids or heavy metals which are found most suitable are the chromate and the tungstate. The chlorate and perchlorate are also found suitable. The nitrate, on account of its acid reaction and hygroscopic nature, is unsuitable for a flashlight powder, even when put up separately from the magnesium powder, since under these conditions the salt cakes together. Chromate of thorium in the two forms, one containing some water of crystallisation, the other none, both produce a very rapid flash (difference from chromate of cerium). A suitable formula for a flash powder

is 30 to 35 parts of magnesium powder mixed with 70 parts of thorium chromate. For a slow burning powder 1 part of magnesium is mixed with 2 parts of thorium tungstate. Salts of peroxide of thorium may be produced by precipitating nitrate of thorium with hydrogen peroxide in a solution containing also the acid which it is desired to combine with the thoria. Thus a solution of thorium hydroxide in perchloric acid gives a gelatinous precipitate of perchloride on addition of hydrogen peroxide, heating the solution to 140 deg. F. and rapidly cooling. This compound forms a white, brittle, glassy mass, which is easily powdered, and keeps well in the air. It does not cake, and may be easily mixed with magnesium.—Eng. Pat., No. 14,692, 1908; "B.J.," Mar. 12, 1909, p. 202.

Slow-Burning Flash Powders.—C. Bethge has patented the making of a slow-burning magnesium powder or time light, the principle of which is the use of the oxide of a rare-earth metal with magnesium powder, this latter in quantity at least three times the chemical equivalent of the oxygen in the compound of the rare-earth metal. On combustion of a mixture of this kind there is repeated reduction and re-combustion of the oxide of the rare-earth metal. The excess of magnesium may be anything up to 10 times the equivalent of the oxygen in the other compound. Suitable formulæ for these slow-burning flash powders are as follows:—

Magnesium powder, 5 parts; cerium oxide, 3 parts.

Magnesium powder, 250 parts; cerium oxide, 150 parts; vanadic acid, 8 parts.

Magnesium powder, 5 parts; cerium oxalate, 2 parts.

Magnesium powder, 5 parts; cerium oxide, 1 part; calcium hydroxide, 1 part.

Magnesium powder, 5 parts; manganese oxide, 1 part.

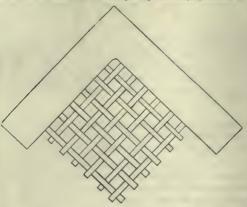
Magnesium powder, 10 parts; cerium oxide, 2 parts; manganese oxide, 1 part.

The average time for the combustion of 2 to 3 gms. of the above mixtures will be 30 seconds.—Eng. Pat., No. 16,448, 1908; "B.J.," Sept. 10, 1909, p. 710.

Electric Firing of Flashlight.—F. E. Keller gives drawings and instructions for making an electrical igniter for firing flashlight powders, which method he has found to be the most certain in practical work. The igniter is used with a battery of eight dry cells.—"Photo-Era," Apr. 1909, p. 185; "B.J.," Apr. 16, 1909, p. 308.

Magnesium Ribbon Sheets.—G. W. B. recommends making magnesium ribbon into a net of coarse mesh for convenience in burning and production of more even illumination when, say, using the ribbon

in enlarging. Two L-shaped frames are made in thin sheet tin or aluminium. (See figure.) The free ends of the strips of ribbon are then fastened in one of the L-shaped pieces by pasting a strip of



paper over them, the other frame being clamped on top. The lower free corner of the network may then be lighted, and the whole will burn about as fast as a piece of paper.—"Cam.," Feb. 1909, p. 60; "B.J.," Feb. 26, 1909, p. 159.

III.—PHOTOGRAPHING VARIOUS SUBJECTS.

Portraiture.

Fireplace Accessory for Firelight Portraits by Daylight .- 1. Kellogg, in producing by daylight portraits having the effect of firelight, as described by H. E. Corke ("B.J.A.," 1908, p. 601), makes use of an imitation fire-grate placed before a half-open window and fitted with a pair of mirrors, one of which, 1, reflects



Back View of Fireplace Accessory. Front View of Fireplace Accessory.

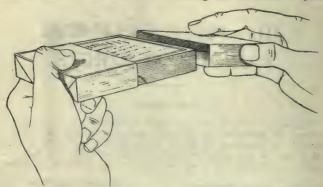
the light on to a second mirror, 3, from which it is reflected through the front of the accessory which is covered with a thickness of tracing cloth, 2.—"St. L. & C. Phot.," Feb., 1909, p. 97.

Photography on Tour.

Hand-Camera Shutter and Exposure-Meter.—W. Booth has patented a mechanism whereby the adjustment of the iris diaphragm of the lens is made in accordance with the subject to be taken, the shutter being set in accordance with the reading of an actinometer. The two adjustments are intended to provide for the correct exposure of the plate without calculation, but it is necessary for this purpose that the plate should have a sufficient (usually a very high—Ed. "B.J.A.") degree of sensitiveness. Eng. Pat. No. 28,185, 1907; "B.J.A." Jan. 29, 1909, p. 88.

Repacking Plates Exposed on Tour .- W. Thomas points out that when plates are to be repacked after exposure in the box from which they were taken, the neatest way of removing the outer

wrapping is to cut it round with a penknife across the centre of the package, as shown in the figure. In repacking, all that is necessary is to replace the two halves of the cover, when a piece of adhesive paper, such as used for binding lantern slides or passe-



partouts, stuck round where the cut was made, will join both cover parts together, and the plates are as secure and safe from injury as when first received from the makers.—"B.J.," May 28, 1909, p. 421.

Numbering Exposed Plates.—H. C. L. recommends writing on the corner of the exposed plate with a fine-pointed steel or a pointer of any metal, or even bone. The pressure effect is rendered visible by the developer, the writing appearing black.—"Bull. Phot.," Mar. 31, 1909, p. 200.

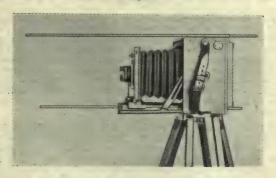
Miscellaneous Subjects.

Street Snapshots After Dark.—H. Wild, using backed Wratten "Panchromatic" plates and a Dallmeyer portrait lens of f/4, has succeeded in taking some very effective views of street scenes in the West-end of London lit only by arc lamps. The exposures were about one second, and plates were developed with pyro-metol (Imperial formula) made up with 1 part No. 1, 2 parts No. 2, and 1 part of hot water to bring temperature up to 75 deg. F. The focus of the lens was $8\frac{1}{2}$ ins., which in a quarter-plate camera enforced a somewhat distant standpoint from the actual subject, an advantage in securing the photographer from close observation. The results enlarged to 15 by 12 showed ample definition and satisfactory freedom from grain.—"Phot." Mar. 16, 1909, p. 207.

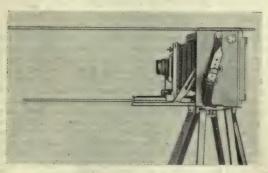
Stop to Use in Night Photography.—H. Wild, in taking street scenes by night where arc lights occur in the picture, states that the good rendering of the lights (freedom from reversal) appears to depend on the actual time the plate is exposed without reference to

the aperture of the lens. Supposing that no more than ten minutes may be given at f/11, it is found that at f/8 about the same time can be given, and very little more than that at f/16.—"Phot.," Aug. 24, 1909, p. 153.

Photographing Insects.—In a paper on a new form of stereoscopic camera (see "Stereoscopic Photography") Dr. W. Scheffer describes an attachment for use in making instantaneous exposures of insects on a large scale (full, half, or one-third size). The arrangement is described as being more convenient and equally as



Showing camera set for reproduction, same size.



Showing the camera set for focus half-scale.

accurate as a reflex camera. On the upper-left and lower right-hand corners of the camera a metal groove is fixed in which a steel rod can move. On these rods, marks corresponding to the 1:1, 1:½, and 1:½ markings on the body of the camera are made, and the photographer, therefore, has nothing further to do than to bring

the focusing adjustment and the marks on the rods into correspondence. The camera is held so that the object being photographed lies exactly between the rods. The image will then be sharp and the object will lie in the centre of the image. This arrangement can also be applied to any of the "Palmos" stereoscopic cameras provided that it has an automatic lens board.— 'Phot. Rund.," Heft 3, 1909, p. 29; "B.J.," Feb. 19, 1909, p. 135.

Copying.

Copying Prints Wet.—Dr. D'Arcy Power recommends copying a bromide print while wet in order to secure better details in the shadows. The print is squeegeed under water in contact with a glass plate, the surface of the latter dried and polished, and placed before the camera under an oblique lighting, so that reflections are thrown away from the lens. Even illumination is secured by a mirror placed at an angle to the easel on the side opposite the light. If the print has to remain so long on the glass that it may dry it may be backed with a piece of rubber sheeting.—"Cam. Craft," Feb., 1909, p. 60.

In Reproducing Pencil Drawings it is sometimes found that the ground photographs very mottled. This is due to the yellow colour of the varnish used by the artist as a "fixative" for pencil and charcoal work. If this trouble is encountered, wet plates should not be used, but a panchromatic plate, which will generally photograph the ground evenly without any filter. If a filter is needed, then only a light yellow one is necessary.—"B.J.," Jan. 29, 1909, p. 36.

Masking the Original.—A useful dodge when copying an original consisting of, say, a design embodying a water-colour sketch is mentioned by R. Earle. In order to prevent over-exposure of one portion when the other was correctly timed, a hole was cut in some orange paper with a sharp knife and a glass plate as a guide, so that it exactly fitted the water-colour, and the paper was then laid down on the design with the water-colour showing through the hole. In this condition an exposure of thirty minutes—which experience had shown to be about right for the water-colour—was given. The paper was then removed, without disturbing the other arrangements in the slightest, and a further exposure of two minutes was given to the whole design. The result proved to be quite satisfactory. Black paper or black velvet would perhaps have answered better; but the orange paper was handy, and seemed to do all that was needed.—"Phot.," May 11, 1909, p. 382.

Photographing Finger-Prints.—H. Nolan gives the following methods of service when photographing finger-prints taken upon different surfaces.

1. Finger-prints in dust.

(a) On colourless glass; illuminate by transparence with oblique light; dark background.

- (b) On dark surfaces (a very easy subject); illuminate by direct light.
- 2. Finger-prints in grease (ordinary finger-prints).
 - (a) On light surfaces such as china plates; dust on (dry) very fine graphite powder; blow off with bellows, etc., not with breath. The "dusting on" is best effected by charging a heavy flat-ended camel-hair brush with the powder, holding it near the surface and jerking it by a blow on the hand which is holding it.
 - (b) On dark surfaces, such as the black or green paint of a safe, mahogany furniture, etc.; treat similarly, using fine, dry whitelead powder.
 - winteleau powder.
 - (c) "Invisible" finger-prints on paper. Develop with aqueous solution of silver nitrate (5 to 8 per cent.).
- Finger-prints in blood on dark surfaces (e.g., black bottles).
 In dark-room illuminate by direct rays of arc or magnesium light, preferably concentrated. One may get reflections, but the pattern of the papillary ridges will stand out clearly.
- -"B.J.," July 23, 1909, p. 583.

Copying Burnt and Faded Documents.—Dr. R. A. Reiss, in a paper describing his method for deciphering by photography inscriptions on documents which have faded with time, or have become partly destroyed by fire, states that in the former case the document is photographed by aid of as powerful a light as possible, direct sunlight or the light of an arc lamp. A faded inscription usually takes the form of faint yellowish markings in the document, and these may be brought out by using a blue filter of copper sulphate solution (to which ammonia has been added) contained in a glass cell. The use of a printing paper such as "Carbon" Velox, or the special "Rembrandt" paper allows of these faint records being further intensified, whilst in some cases it is well to enlarge direct from the original, using the blue filter and developing slowly with ferrous-oxalate. Repeated reduction and intensification of the negative is also a valuable method, as is also the making of reproduced negatives in the camera via a positive transparency. At each of these steps a higher degree of contrast may be obtained.

When treating documents partly destroyed by fire the burnt paper is first rendered less fragile by spraying it (with an atomizer) with fixative, such as is employed for fixing crayon and pastel drawings. A suitable preparation is that of Dr. Schoenfeld and Co., of Düsseldorf. This allows of the burnt paper being spread out flat on glass by aid of a couple of small soft brushes, after which it is pressed flat between two glass plates in a printing frame and copied in the camera. In making the megatives from it similar methods to

those above described are employed.

In making copies of a burnt paper on which writing had been done in pencil the following method has given good results:—The original is laid on a horizontal copying board, or, if it has become crinkled, is pressed in a printing frame; in either case the surface

is placed at an angle of about 60 to 65 deg. to the axis of the lens. The lighting is provided solely and only by an incandescent gas burner provided with a reflector. This burner is placed to the side of the original remote from the lens, so that the rays fall upon the surface at an angle of about 30 deg. A yellow-sensitive plate is used. The rays are reflected by the inscription, and the latter can sometimes be faintly seen on the focussing screen. In the negative the inscription is thus obtained in black on a more or less transparent ground. A very protracted exposure requires to be given.—"Bull. Belge," Apr., 1909, p. 152; "B.J.," July 9, 1909, p. 533.

Adjusting Plate and Original Parallel.—Douglas Carnegie has devised the following apparatus, which he terms a "parallelizer," for ascertaining that the focussing screen or plate is in proper parallelism with an original, such as a painting, which is being copied away from the studio. The apparatus is made as follows:—

At one end of a bar of wood 10 ins. long and 1½ ins. broad, seven pins (P) are fixed in vertical positions, one-eighth of an inch apart from each other. (Fig. 3.) A peep-hole (S), made by boring a hole one-twentieth of an inch in diameter in a piece of sheet zinc (Z), is affixed to the other end of the bar. If the refraction of the observer's eye is not normal, a lens of suitable power and sign must be fixed centrally over the peep-hole.

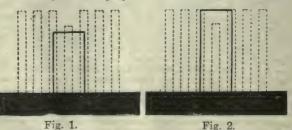


Fig. 1.—Appearance when the parallelizer is adjusted in azimuth, but not in altitude. (Full line represents the central pin; dotted line represents the mirror images of the pins.)

Fig. 2.—Appearance when the parallelizer is adjusted both for azimuth and altitude.

The side of the zinc plate facing the pins should either be painted dead black or covered with black velvet. The pins used are of the large size (1-20th in. diameter) known as "blanket pins." The points and heads of the pins are cut off so that inch-and-a-quarter lengths of uniform diameter are obtained, and the ends are smoothly filed off at right angles to the longitudinal axes. By means of a saw of slightly narrower cut than the diameter of the pins, shallow slots are made in a small strip of wood at intervals of one-eighth of an inch. The pins are pressed into these slots, and another flat strip of wood is screwed on to the slotted piece, so as to bind the pins

securely in position. Before screwing up tight care must be taken that the tops of the pins are in accurate alignment. The pin holder (H) is now nailed to the end of the bar, and for purposes of easy identification the top half of the central pin is painted black on the side away from the peep-hole, the whole of the portion of the central pin facing the peep-hole being left bright. The bar itself is now mounted on a tripod by means of a small ball and socket head, such as can be purchased for a shilling.

Suppose the object to be photographed is a picture (P), inclined to the vertical wall on which it hangs. (Fig. 4.) The camera (C) (which should also be mounted on a substantial ball-and-socket head) is set up in front of the picture at such a distance as to give the desired scale of reproduction. It is adjusted so that the focusing

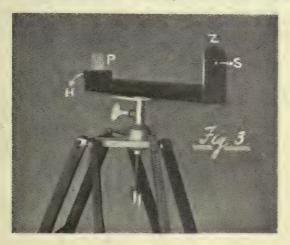


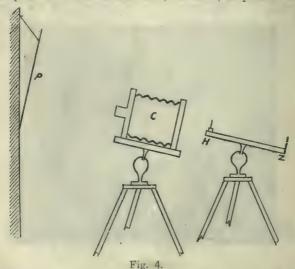
Fig. 3.

screen is as nearly parallel to the picture-plane as can be judged by the eye. The picture is centred and roughly focussed. The lens is now unscrewed from its mount, and the focussing screen removed from the back of the camera. The parallelizer (HZ) is set up as close behind the camera as is consistent with good illumination of the pins, and its line of sight is directed along the axis of the camera. A small piece of patent plate mirror (M) (1-16th inthick) is stuck flat on the glass of the picture by application of wads of soft wax at the corners. If the picture is not glazed the mirror must be held up against the picture surface by an assistant.

On looking through the peep-hole of the parallelizer the pins and their virtual mirror images will be seen. The parallelizer is now turned in azimuth (laterally) till the central pin centrally overlaps

its mirror image, the latter easily recognised by its appearing shorter than the images of the other pins, owing to the black paint with which its upper front half has been treated. (Fig. 1.) The parallelizer is then turned in altitude (vertically), so that the top of the central pin is in perfect alignment with the tops of the images of the other pins. (Fig. 2.) The focussing screen is now replaced, a piece of mirror affixed to its hind surface, and (the ball joint of the camera having been loosened so as to move smoothly when gently urged) the camera is adjusted on its head till a similar coincidence and alignment to that just described is again obtained on looking through the peep-hole at the focussing screen mirror.

The plane of the screen must now, of course, be parallel to the



picture plane. The lens is replaced in its mount, and the picture is finally and critically focussed.

The advisability of using a camera and plate of larger size (e.g., of using a half-plate for the production of a negative of quarter-plate size) will be clear, for if in the preliminary focussing the image just filled the screen, the final adjustment with the parallelizer would result in throwing some of the image off the plate altogether. It is also advisable that the camera be of the front focussing type.—"Photo Notes," May 14, 1909, p. 87; "B.J.," May 14, 1909, p. 377.

A further device for the same purpose is described by Montagus Troup as follows:—A white metal tube, 6 ins. long, 1½ ins. in diameter, and not less than 1-16 thick, is fixed at right angles to the centre of a piece of blackened board 6 ins. square and 1 in. thick.

To each corner of the board a piece of narrow tape is attached, and this completes the apparatus. For the sake of portability the tape is made detachable, fitting over a short piece of inner tube perman-

ently fixed to the board.

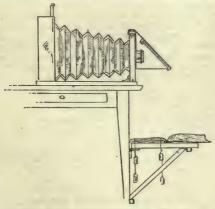
To use the instrument it is placed against and in contact with the object to be photographed, as near the centre as possible, and the four pieces of tape are fixed with pins to the edge of the frame or board, stretching them tightly, so that the tube stands at right angles to the object. The camera is then set up and the image brought to the size required.

On looking at the screen the instrument will show as a white

tube with a black centre, standing forward on a black border.

As long as the screen in the camera is not truly parallel to the object we shall see the white tube elongated on one side, but as soon as the camera and object are truly parallel the front elge of the tube will show as a true white circle, with a black centre and black background. The entire operation is very simple and takes no time to complete, while the instrument can be made out of the simplest materials.—"Photo Notes," June, 1909, p. 105.

Copying in Libraries.—J. Fassbinder points out the use which can be made of negative copies on bromide paper (white lines on black ground) of documents, printed books, etc., in libraries. The camera is fitted with a reversing mirror which allows of the original



being simply laid on a convenient shelf and the open page kept flat by weighted lengths of silk. With practice, six exposures may be made in ten minutes, inclusive of reloading the six dark slides.—
"Phot. Mitt.," Heft. 13, p. 195; "B.J.," July 9, 1909, p. 537.

Contact Copies of Plans, etc.—E. E. Fournier d'Albe has independently rediscovered the method of J. H. Player, by which copies of plans, etc., which may be opaque and printed on both sides are copied by placing a sensitive material, sensitive side in contact with the plan, and exposing to light through the sensitive plate or paper. The image thus obtained is formed by the different reflective powers of the parts of the plan. Mr. D'Albe calls the process "anastatic photography," and describes the various ways in which it can be carried out with photographic plates or papers. For plates a developer, both giving contrast and acting quickly, is best—e.g., hydroquinone in conjunction with caustic potash, or 1:15 rodinal. The exposure for the latter should be rather longer. The normal exposure to light is that which would be required to make a positive transparency from an average negative on the same kind of plate. The latter should be of the "photo-mechanical" type, on account of the greater contrast. The fog which is also produced is removed by short use of a strong reducer, such as Farmer's. It's best to make a rather weak impression in the first instance, and let it develop right down to the glass. The requisite contrast can also be obtained by making a second negative from the first.

Applying the "anastatic" method to carbon printing, a gelatine film on a glass plate (a fixed and washed dry-plate) is sensitised in saturated solution of potass bichromate and allowed to dry in the dark. It is placed with the film in contact with the drawing and exposed through the glass for about thirty minutes in diffused laylight. Here the soluble parts are on the surface, and necessity for transfer is obviated. A plate in perceptible relief is obtained. If a negative is wished the plate is developed in a mixture of water

and Indian ink.

A positive direct from the drawing is produced by using a dryplate soaked for five minutes in 10 per cent. potass bichromate solution. This is exposed as before by laylight, and developed with dilute rodinal. Here the bright portions of the original make the gelatine more insoluble than the dark portions. The latter, therefore absorb the developer and produce a blackening of the silver salt contained in them. The positive may be fixed in hypo in the usual manner.

Printing-out paper does not prove successful with the "anas-

tatic" method.

The bleach-out action of light on primuline may be employed. Gelatine-coated plates or papers are soaked in primuline solution and sensitised in—

Sodium nitrite	100 grs.	7.6 gms.
Hydrochloric acid	$\frac{1}{2}$ oz.	16.5 c.c.
Water	30 oz.	1000 c.c.

This gives a reddish-brown film, which, after washing and drying, is exposed in contact with the original as before, and gives a positive direct.

A similar bleach-out process is that based on the exposure of paper sensitised with ferric chloride and oxalic acid. This gives yellow lines on white ground, and the copy is then used as it is for making a negative on bromide paper; or, instead of thus printing, the copy may be developed with citric acid and alum (I part of each) dissolved in water (85 parts), in which the print is immersed

to give a black image with the ferric salt, thus giving a black

positive copy of the drawing.

The author has devised a printing cabinet, serving for the making of copies from originals, such as illustrations in books, etc., which are somewhat awkward to handle.—"English Mechanic," Apr. 30, p. 287; May 14, p. 335; May 21, p. 359; and May 28, p. 383, 1909.

Stereoscopic Photography.

Commercial Stereoscopy.—A description (from "American Industries") of the machine methods of turning out large quantities of stereoscopic prints and some notes on the industrial uses of the prints appear in "B.J.," Apr. 30, 1909, p. 346.

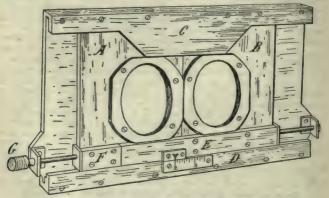
Automatic Stereoscopic Camera.—A type of camera for stereoscopic work which may be suggested to camera makers is one in which the adjustable front is made to work automatically with the focal extension of the instrument, a greater separation being thus imparted to the lenses as the camera is racked out in focussing near objects: If properly adjusted, the principal object in view will always be represented in the centre of each of the separate stereo images, so that when using ordinary stereo size plates the maximum separation for distant objects should be 3½ ins. The production of a half full-size image will then require the separation to be reduced by one-third, that is, to about 2 ins., which is generally the least separation that can be arranged with lenses of ordinary size. Larger images than this will seldom be required. The rule governing the amount by which the separation must be diminished as the camera is racked out is a very simple one. If the additional extension of the camera beyond the infinity mark is equal to the focal length multiplied by $\frac{1}{r}$, then the separation must be reduced by an

amount equal to the maximum separation multiplied by $\frac{1}{r+1}$. That is to say, when making a quarter full-size image we must reduce the separation by one-fifth, or when making a one-sixth full-size image we must diminish the separation by one-seventh, which is nearly half an inch if the original separation is $\frac{3}{4}$ ins. The automatically adjusting front will render mistakes impossible, and greatly diminish the trouble of setting up the camera.—"B.J.," Dec. 11, 1908, p. 937.

Focussing and Separation of Stereo Lenses by one Automatic Movement.—A camera on the lines suggested above is described by Dr. W. Scheffer as having been in course of working out since a date prior to February, 1908. The two stereoscopic lenses are placed in sliding panels each connected to a two-armed lever. The lower extremities of these levers move in a pair of straight grooves inclined at an angle to each other, the grooves being made in metal and fixed in the ordinary baseboard of the camera. The further the lens-board is racked out from the ground-glass, the further the lower extremities of the levers are separated from each other, and

therefore the nearer the lenses are brought together.—"Phot. Rund.," Sept. 3, 1909, p. 29; "B.J.," Feb. 19, 1909, p. 135.

Adjustable Stereo Front.—A new design of lens-panel allowing of the pair of stereoscopic lenses being used upon it at a separation (from centre to centre) of from 2 ins. to $3\frac{1}{2}$ ins. has been made by providing a straight bellows between the two separate panels carrying the lenses. The folds of the bellows, which is made of roller blind material, are $\frac{1}{4}$ in. wide, and are perforated so as to run along two guiding wires. Their edges are protected at the back by thin metal flanges, which overlap the bellows by about 1 in., and in front by the slips that hold the sliding panels. A right-and-left screw actuates the two panels. A and B are the two lens panels, connected together by the straight bellows H. C and D are guide strips that hold the panels in place, while F and E are strips protecting the right-and-left screw G. F is fixed to panel

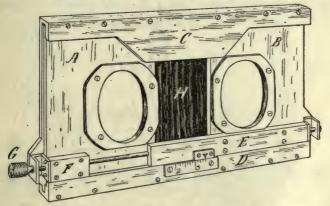


Perspective view of the front, showing the lenses at the minimum separation.

A, and E to panel B; they therefore travel with the panels, while E always overlaps panel A sufficiently to protect the lower edge of the bellows in the gap between the two panels. C is widened out in the centre for the same purpose. E and D are rebated, so that no light can pass between them. The upper and lower edges of the bellows, H, are perfectly protected from direct light, but not from oblique light passing behind C and E in the space left in front of the bellows when the panels are separated. Any possible leakage from this indirect light is, however, perfectly guarded against by two thin metal strips, fixed at the back of the panel. These strips also prevent any buckling of the bellows at the back, and the absence of similar guards in front necessitates the use of rods which pass through perforations in the folds of the bellows, and serve as guides to keep them in place.

The adjusting screw, G, is a & Whitworth thread. One complete turn of this screw alters the separation by 1-20th inch. The scale attached shows & th of an inch, the index moving with E and panel B while the scale is fixed. The screw fits tightly in a square slot cut half in the panels and half in F and E, and this fact, coupled with the small pitch selected, renders an accidental movement almost impossible. The screw plates are fixed at the ends of F and E where shown, the end plates being bearings only. The head of the screw is within easy reach while focussing, and the separation can be adjusted to a nicety while watching the images on the ground glass.

The front illustrated is $3\frac{3}{4}$ ins. wide, $7\frac{1}{8}$ ins. long, and $\frac{1}{2}$ in. thick. It was made to fit the front of a blind shutter, and to give a maximum separation of $3\frac{1}{2}$ ins. By allowing for only 3 ins. separation, and substituting metal for wood, it could be diminished in both



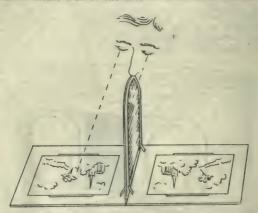
View of the front, showing the lenses at the maximum separation.

length and thickness, but it is by no means a bulky article as it stands.—"B.J.," Apr. 23, 1909, p. 319.

The above adjustable panel may also be used so as to dispense entirely with trimming down of the prints obtained from the stereoscopic negative. To effect the adjustment in the camera, first of all make a negative, and then measure the separation between the corresponding margins of the two pictures. Note the distance, and afterwards, when making other negatives, simply adjust the front so that the corresponding images of the nearest details in the subject are separated by a slightly less distance. If the print-trimming is then confined to the removal of the margins, it will be found that in the mounted print these nearest details are separated by a slightly greater distance than the print margins, which is the result that is most usually desirable. If it is desired to make any part of the subject appear to stand out in

front of the mount, then the adjustment in the camera must be of just the opposite nature. That is to say, we must adjust the front so that the images of the near object are rather more widely separated than the margins of the negatives, but this is only desirable in very exceptional cases.—"B.J.," May 7, 1909, p. 358.

Modified Dixio Stereoscope.—A. Lockett points out that a more useful form of the Dixio stereoscope for commercial purposes, although less efficient than the normal pattern, is one in which the two prints on either side of the division form a flat surface. It is



necessary to have the pictures rather more widely separated and to use a larger mirror—that is, one extending down to the bottom of the panel in the case of a large picture.—"B.J.," Sept. 10, 1909 p. 701.

Stereoscopic Vision in the Stereoscope.—C. Welborne Piper, by means of a "vision box," described in a paper before the Photo graphic Convention, concludes that the appreciation of relief in the stereoscope depends on perspective and on the sensations aroused by the unusual manner in which the acts of convergence and of accommodation are accomplished. These unusual sensations would not exis at all but for the fact that the two pictures which make up the slide are in one plane, so that the accommodation does not vary with the convergence as it does in ordinary vision. Experiments with the vision box show that if perspective effects are excluded no appreciation of relief exists in the case of a real object, though in the case of a stereoscopic representation of it the relief is obvious at a glance. The vision box was designed to permit the observation of two simple points in space at differing distances, no perspective effects being visible. The general conclusion was that we rely entirely on perspective when observing the natural object, while in the

stereoscope our appreciation of relief is further aided by parallax. Appreciation of distance in all cases depends on perspective alone.—"B.J.," July 16, 1909, p. 549.

STEREOSCOPIC PROJECTION.

Stereo Projection by the Pinatype Process.—Dr. E. König has worked out suitable dyes for staining transparencies and for the making of viewing-filters to be used in the so-called "Anaglyph" method of obtaining stereoscopic effects. A pair of pinatype transparencies are projected on the screen in approximate superimposition, one stained with red and the other with green dye. The observer is provided with a pair of spectacles fitted with red and green glasses, the red image on the screen being observed through the green glass, and vice-versâ. In working the process the special dyes known as "complementary red" and "complementary green" are employed in making pinatype transparencies from the pair of stereoscopic pictures. For the observation filters the following formulæ are used:—

Gelatine 6 gms.

Distilled water Solution of Rapid Filter Red I. (1:40 in water)	
The mixture for the green filter is as follows:— Gelatine	6 gms.
Distilled water	100 c.c.s.
water)	5.10 ccs

The spectacles for use by daylight should be 10 cm.; for projec-

tion purposes, 5 cm.

In regard to the projection of the transparencies, it should be noted that the latter should be placed in the carrier so that the green picture faces the light source, and the spectacles so used by the observer that the right eye looks through the green filter, the left eye

through the red.—"B.J.," Nov. 6, 1908, p. 848.

Arising out of a demonstration of this method at the Royal Photographic Society the following notes deal with the conditions which would appear to militate against the successful use of this method. Assuming that the right-hand stereo picture was printed in green and viewed through a red screen placed in front of the right eye, while the left-hand red picture is seen by the left eye through a green screen, it is evident that the pictures cannot coincide in all parts. If the overlap of the green picture towards the right is too great, say, over 21 inches, it will be impossible to combine the pictures in the eye that is, the overlap in the actual slide must be such that it should be magnified on the screen to a greater amount than 24 inches. If, however, the green image overlaps the red on the left, the amount of overlap on the screen will not affect the power of combining the images, since any degree of convergency can be given to the visual axes, but the combined image will then appear to be in front of the screen. In short, the control is the same as that exercised in trimming an ordinary stereoscopic print, but it is evident that the distance of the lantern from the screen must be

taken into consideration.

It may often be difficult to avoid exaggerated relief in the case of near objects, since these latter must be observed under a very small angle of convergence. It therefore seems that to avoid such distortion in the projection method objects near to the camera must be avoided—that is, long-focus lenses employed when making the negative.—"B.J.," Feb. 26, 1909, p. 154.

Dixio Stereoscopic Lantern Slides.—A. Lockett suggests the application of the Pigeon, or "Dixio," method of stereoscopic observation ("B.J.A.," 1909, p. 563) to projection. The two stereoscopic megatives are reduced in the camera on to a single lantern plate, the pair being obtained side by side. As in the case of prints for the Dixio stereoscope, one transparency must be the reverse of the other. The slide being projected in the ordinary way, the spectator is provided with a small piece of mirror, which he holds in an upright position against the mose, pointing the plane of the mirror towards the central division between the two pictures on the screen. Then, looking at the right-hand picture with the right eye, the mirror is slightly turned until the reflection of the left-hand picture falls over the first, thus giving the stereoscopic effect.—"A.P.," Nov. 17, 1908, p. 468.

Photo-Micrography.

Photo-Micrography with a Reflex Camera.—Dr. W. Scheffer describes a camera of the reflex type especially constructed by the firm of Carl Zeiss for photo-micrographic work. The arrangement allows the operator to adjust both the coarse and fine focussing, the stage movements, the Abbé illuminating apparatus, and other lighting accessories on the optical bench—all with one hand, whilst watching the effect of this adjustment on the ground glass.—"B.J.," Mar. 12, 1909, p. 194, and Apr. 16, p. 307.

IV.—NEGATIVE PROCESSES.

THE WET COLLODION PROCESS.

Brown Stains on Wet-Plate Negatives.—A wet collodion negative, which is finished by blackening with sulphide of ammonium or sodium, sometimes shows bad brown staining. This is generally due to insufficient washing between development and fixing. But it may be due to insufficient fixing, and where the fixing is done by placing the plate in a bath of cyanide solution, this ultimately becomes so saturated as to fail to dissolve out the double cyanide and silver salt first formed on placing the negative in it. Thus, although the negative appears fixed, it is not so really, and a brown stain results. When the fixing bath is renewed it will be found this trouble disappears.—"B.J.," Feb. 12, 1909, p. 125.

PLATE BACKINGS

Anti-Halation Plate.—J. Hauff and Company, of Feuerbach, have patented the use of ferrocyanide of molybdenum as an anti-halation substratum for gelatine plates. It is formed by coating the glass plates with a solution containing in 100 ccs. of water 3 gms. of gelatine, 1.5 gms. of potass ferrocyanide, and 1 gm. of ammonium molybdate. When this coating has set, it is treated for five minutes in two per cent. hydrochloric acid, and placed to dry. It is evidently intended that the backing should be removed by the alkali of the developer, so that if it is found that the process can be carried out satisfactorily in the factory, the user of these anti-halation plates will not be called upon to perform an additional operation.—Ger. Pat. No. 210,057 of Dec. 14, 1907.

EMULSIONS.

Silver Acetylide Emulsions.—Dr. C. E. K. Mees and S. H. Wratten have prepared silver acetylide emulsion with the object of discovering if a latent image is formed on exposure to light. Silver nitrate solution was precipitated with ammonia and further ammonia added until the precipitate just redissolved. Five per cent. of soft gelatine was then added to the solution and acetylene gas led through the latter in the dark. A heavy crust of the salt was formed on the surface and a fine-grained emulsion was also formed. On removing the crust and coating plates with the emulsion, it was found that the plates were very sensitive to light (they showed a change in about 1-10th the time of printing-out

paper), but gave no sign of the formation of a latent image. Alkaline developers blackened both exposed and unexposed plates equally, while neutral or acid developers either blackened them uniformly or produced no change. Since silver acetylide is a compound, a sub-salt of which is extremely unlikely, the authors regard the experiment as support (although of a negative nature) of the sub-salt theory of the latent image.—"Phot. Journ.," Oct., 1908; "B.J.," Oct. 30, 1908, p. 831.

Orthochromatic Processes.

Properties of Dyes.—Dr. C. E. K. Mees and S. H. Wratten described the methods and apparatus used in measuring absorption spectra of dyes used for sensitising plates and for making light-filters and safe-lights. In the case of dyes for light-filters it is usually required that a filter should absorb as completely as possible the region which it is required to absorb, and transmit as completely as possible the region which it is required to transmit. The degree to which a dye will do this depends mainly on the sharpness of its absorption band. The edge of an absorption band which is towards the red end of the spectrum is nearly always sharp, and such dyes do not absorb light other than that in their absorption band proper. A red dye having an absorption band in the yellow-green, or a yellow dye having an absorption band in the blue, are bright dyes transmitting the red or green and red portions of the spectrum completely, but if the absorption band faces the other way, as in the blue and blue-green dyes, it will generally be more gradual, and there will be a great absorption of the portion of the spectrum which should be transmitted. This is well shown in the case of the tricolour filters. The red tricolour filter will transmit about 75 per cent, of the incident red light, but the best green filter only about 35 per cent. of the incident green light, and a blue filter only about 16 per cent. of the blue light. When examining dyes for use with filters, the great object is to choose those which have the sharpest possible absorption and the least residual absorption in other portions of the spectrum.

In making blue filters, toluidine-blue is of great use, although, like toluidine-green, it has a shallow absorption. The new filter, blue-green, has a sharper absorption, and is most useful for green and blue-green filters. For absorbing the extreme red, methylene-blue has a unique absorption, showing a double band, with maxima at 6,800 and 6,100, but unfortunately, like auramine, it is sensitive to heat, though permanent towards light; if possible it is well to avoid using it. Erio-glaucine, one of the Patent-blue series, is made by Geigy, of Basle, and has a sharp absorption in the red, with maximum at 6,250.

Dyes absorbing the yellow and orange part of the spectrum are nearly all basic, and thus are not suited for use with gelatine nor for mixtures with acid dyes. The methyl-violets (basic) can be well replaced by the acid violets, which are of even sharper cut in the

deep red. The rapid filter blue of Hoechst has also the advantage of

being an acid dye, but is of very shallow cut.

For the absorption of the green two groups of dyes are used, the fluorescines (acid) and the rhodamines (basic). Fluorescine itself or uranine absorbs only the blue-green. Rose-Bengal has a sharp band, with a maximum at 5,600, and is probably the best dye for the red filter in three-colour work. It is not quite permanent, any more than most of the dyes mentioned, but will stand full daylight and sunlight for three months. Rhodamine B is the only dye of this class of general use, but there is another dye—Xylen-red (Hoechst)—which can be taken as belonging to both groups. It is both an acid and a basic dye, works perfectly with gelatine, and will mix with the acid dyes. It has the sharpest absorption-band towards the blue, and makes a nearly perfect minus green dye.

The only yellow dye which absorbs the violet satisfactorily and yet transmits the ultra-violet is para-nitroso-di-methyl-aniline. Tartrazine absorbs a good deal of ultra-violet, but not all. Filter Yellow K absorbs all the ultra-violet except in dilute solution, in which case (for pale filters) picric acid is better, though this cannot be used if the filter is much exposed to light, as the dye goes brown. For the absorption of the ultra-violet from 3,900, aesculine is the only known substance, but if the extreme ultra-violet from 3,600 to 3,000 only need be absorbed, beta-naphthol-di-sulphonic acid is a more satisfactory substance, and does not darken in light nearly so

quickly

In order to make a filter which transmits the ultra-violet but does not transmit the visible spectrum, it is necessary to use para-nitroso-di-methyl-aniline with blue-violet dyes, and unfortunately these blue-violet dyes always strongly absorb the ultra-violet, the rhodamines and xylen red having an absorption band there. In order to avoid this difficulty there may be obtained from Schott and Genossen, of Jena, some of their blue uviol glass, which is extremely transparent to the ultra-violet; by cementing the film between two pieces of this glass a satisfactory ultra-violet filter can be prepared.

The paper gives photographs of the absorption spectra of some twenty-five dyes—viz., those of most service for the making of filters.—"Phot. Journ.," May, 1909, p. 235; "B.J.," May 21, p.

399, and May 28, p. 422, 1909.

The authors have since published an atlas recording the absorption spectra of dyes of service in orthochromatic photography.

Cyanine and Other Dyes as Mixed Colour-Sensitisers of Gelatine Plates.—A thesis by Guido Daur gives the results obtained by using the chief sensitisers in various mixtures both as bath-sensitisers and as additions to the emulsion.—A translation of the paper appears in "B.J." July 23, p. 572; July 30, p. 592; Aug. 6, p. 610; Aug. 13. p. 630; and Aug. 20, p. 649, 1909.

Developing Panchromatic Plates.—R. Krayn has patented the use of an acid bath or acid developer for the treatment of red-sensitive plates prepared with dyes, such as pinachromes, which are devolourised by acids. This has for its purpose the destruction of the

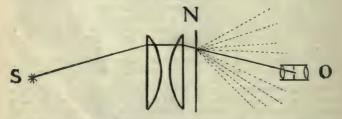
red-sensitiveness of the plate after exposure, and is on the lines of the acid diamidophenol developer which has been stated to be effective for the same result, although some experimenters have failed to find that it does behave in this way. If the process recommended by Krayn be that mentioned in the patent specification—namely, the use of a ½ per cent. bath of sulphuric acid before development with ferrous oxalate, or the addition of acid to the developer itself—it is possible that the stronger sulphuric acid may be able to effect a more complete action than that of sulphurous acid.—Ger. Pat., No. 209,937, Oct. 4, 1907; "B.J.," July 16, 1909, p. 546.

Aberrations Caused by Colour-Screens.—G. Sacco has published a mathematical paper describing the permissible departure from flatness in the case of light-filters placed behind a lens. His results show that a filter should be rejected if the angle between its two surfaces is greater than one minute.—"B.J." (Colour Supplement) (from abstract by L. P. Clerc in "Procede," Jan., p. 7., and Feb., p 21, 1909), July 2, 1909, p. 53.

Sensitometry, etc.

H. and D. Photometer.—Douglas Carnegie recommends, in place of the ordinary grease-spot indicator, a paraffin block indicator first used by Joly. It allows of readings being made with much less fatigue. The drawing of the block and directions for making it are given in "B.J.," Mar. 12, 1909, p. 197.

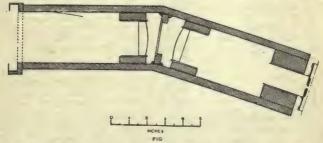
Scattering of Light from the Films of Negatives.— André Callier has made elaborate measurements of the extent to which the light passing through a photographic negative is scattered instead of continuing in the directions in which it approached the negative.— "Phot. Journ.," Apr., 1909, p. 200.



Dr. C. E. K. Mees, in an abstract of Callier's paper, points out that this scattering of the light accounts for the greater contrast obtained when making an enlargement by artificial light (are or limelight) as compared with daylight. The difference is due to the fact that the light scattered from any point of the negative does not enter the objective. (See Fig.) Its effect is thus lost, whereas in contact printing this is not the case. If the light

reaching the negative in the enlarging lantern is itself perfectly diffused or scattered beforehand the effect is no longer seen, results obtained by enlargement having the same gradation as those by contact. In order to secure this scattering of the light it is necessary to use opal glass in contact with the film of the negative. The difference between enlarged and contact prints is, of course, less marked when daylight is used as the illuminant than when a light of small area, such as arc or limelight, is employed.—"B.J.," Apr. 30, 1909, p. 343.

A Simple Spectrograph.—Chapman Jones, in designing a spectrograph most suitable for the general use of those making tests of plates, etc., prefers the construction shown in the drawing. The instrument consists of a tube, or gutter with a lid, of square, cross-section 3 ins., the two parts being inclined at an angle of 18 deg. The changing back is at one end and the slit, or series of slits, at the other, being carried in a brass tube sliding in a thick cloth-lined tube. The grating of 15,150 lines to the inch is mounted in the centre, a lens on either side of it, each mounted in a square fitting to slide easily into place and to remain in alignment whatever the position of the apparatus. The lenses are the ordinary achromatic combinations as made for field-glasses, 2 ins. in diameter and about 8 ins. focal length. The slits used are 026 mm.



(1-1,000th of an inch), '1 mm. (1-250th of an inch), and '2 mm. (1-125th of an inch), in addition to the aperture in the slit-plate carrier, which is 2 mm. (1-12th of an inch), and is useful when material of very low sensitiveness is being examined. A diffusing screen placed thus in front of the slit is made with two pieces of finely ground glass separated by a small mask and bound together with the ground surfaces outwards. This tends to uniform results and renders the adjustment of the direction of the light of much less importance. Exposures, with rapid plates and '1 mm. slit, are about as follows:—The crater of a small (4 or 5 ampères) are 12 ins. distant from the ground glass in front of the slit, from ten to twenty seconds; a Nernst lamp with two filaments 4 ins. away, three to six seconds; a candle 2 ins. away, one and a-half to three minutes; and very poor daylight, when an exposure meter exposed

out of doors needed two minutes to reach the standard tint (about four seconds would suffice on a bright day), from thirty to sixty seconds. The control given by altering the slit width would in all cases bring the necessary exposures within convenient limits. The instrument is made for ½-plates, but for longer spectra the lens between the grating and the plate is replaced by one of greater focal length and the photograph taken by aid of a larger camera.—"Phot. Journ.," Feb., 1909, p. 110.

Developers and Development.

DEVELOPERS.

Properties of Developers.—A. and L. Lumière and A. Seyewetz have published the result of examining a number of developers as to the effect of temperature, etc., upon contrast, etc. They find that in the case of developers working without alkali (metoquinone and diamidophenol) there is no appreciable loss in the contrast produced on rise of temperature of the developer, but fog increases to a considerable extent. In the case of developers working with alkali their results are as follows:—

Developer.	Reduction of Contrast with Rise of Temperature.	Increase of Fog with kise of Temperature.
Pyro	Slight	Very considerable
Paramidophenol	Slight	Very slight
Metol	Slight	Slight
Hydroquinone	Very great	Very great
Metol-hydroquinone	Slight	Slight
Hydramine	Slight	Very slight
Adurol	Very great	Great
Edinol	Slight	Very slight
Glycin	Slight	Considerable
Eikonogen	Slight	Slight
Pyrocatechin	Slight	Very slight

Among the developers amenable to reduction of contrast by dilution they place first diamidophenol, pyro, paramidophenol, metol, glycin, and eikonogen. Those less marked in this respect are hydroquinone, metol-hydroquinone, adurol, edinol, and pyrocatechin. The effect is less still with metoquinone, and not noticeable at all with hydramine. In the case of developers which work without alkali—that is, with sulphite—reduction of the sulphite tends to increase the contrast—more markedly in the case of diamidophenol than in that of metoquinone. On the other hand, more sulphite or dilution of the developer reduces contrast, the practical method being to weaken the developer (diamidophenol) with about three times its bulk of a 5 per cent. solution of anhydrous sulphite of soda.

For increase of contrast the most practical means with all developers is addition of potass bromide in moderate proportion only. Those giving the maximum increase are pyro, hydroquinone, adurol, glycin, and eikonogen.—"B.J.," Aug. 13, 1909, p 627.

Acid Diamidophenol Developers.—M. G. Underberg gives the following stock solutions and developing formulæ for use with diamidophenol developer (compare those by G. Balagny, "B.J.A.," 1909, p. 573).

This keeps well for several months in closed bottles, but there is no object in preparing more than 150 ccs. (5 ozs.) at a time.

S.—Soda sulphite, pure, anhydrous 20 gms. $\frac{3}{4}$ oz. Hydroquinone 1 gm. $\frac{1}{2}$ grs. Water, boiled, hot 100 ccs. $\frac{3}{2}$ ozs.

Add the sulphite to the freshly boiled water, stirring well; then add the hydroquinone, filter, and keep in stoppered bottles of 100 c.c.s. (3½ ozs.) capacity. It is convenient to make up 300 c.c.s. altogether (three bottles), which quantity will keep for, at any rate,

three months in regular use without appreciable alteration.

Diamidophenol made up with acid sulphite is a perfect developer of all brands of plates, both extra rapid and orthochromatic. It is a developer which never gives fog nor stain, and possesses great latitude in use as regards the degree of contrast or softness which may be obtained with it, always assuming that development is thorough. This latter is an absolute essential in the use of the developer; and those who have not obtained satisfaction in the use of diamidophenol may be certain that their failure has arisen from negligence in this matter. With almost all the brands of plates the image should appear quite distinctly on the back of the plate. Developing in this thorough way, up to the point when the image commences to veil over, there are obtained excellent negatives, the slight veil which appears towards the latter part of development completely disappearing in the fixing bath. The tendency when commencing the use of the developer is to stop development too soon. In the case of those who employ the two-solution method given below, over-development will not do any harm, whilst curtailed development leaves the negative without its full detail and brilliancy. The following is the method of working the two-bath system. Two developing baths are prepared as follows:-

A.—For over-exposure: gives hardness.		
Solution S	8 ccs.	J OZ.
Diamidophenol	·5 gm.	4 oz. 8 grs.
Solution BB		
Water		½ oz. 3½ ozs.
B.—For under-exposure: gives softness.		2
Solution S	30 ccs.	1 02.
Diamidophenol	·5 gm.	8 grs.
Solution BB	24 drops	24 drops
Water		83 ccs.

The negative is first placed in A. If at the end of three to five minutes no image has appeared, it is placed in bath B, and carefully watched. If the image on its first appearance shows a tendency

to flatness and insufficient contrast, it is at once placed in bath A. If, on the other hand, it appears vigorous without detain, it should be left in B until it has acquired the necessary softness. The plate is thus transferred from A to B, and inversely, according to the result desired, in either case being developed through to the back. Care is necessary to work in a perfectly safe light, and to avoid removing the plate too frequently from the developer. With some practice it is quite easy to judge of the thoroughness of development by reflected light whilst the plate is lying in the dish. After development the plate is given a good rinse and fixed in a bath of acid hypo.

The following procedure may be of advantage when a large number of plates are to be developed. The bath A given above is made up, and water added to make a 1,000 c.c.s. (35 ozs.) altogether. The negatives are placed in this weak bath, and at the end of five minutes one or two plates taken out and developed by the two-bath method already given. By the time these two plates are developed others will commence to appear in the stand solution. A second two, those which have come up the most, are then taken and developed in the two solutions, this method being followed until the whole batch has been got through.—"Photo-Revue," July 4, p. 1; July 11, p. 10; July 18, p. 18; July 25, p. 25, 1909; "B.J.," July 23, 1909, p. 570.

For the formula for development of bromide and gaslight papers, see under "Bromide and Gaslight Papers."

A formula for making a powder diamidophenol developer ready for solution in water is given as follows by M. Underberg:—

Soda sulphite anhydrous	30 gms.	1 oz.
Diamidophenol	5 gms.	80 grs.
Soda metabisulphite cryst	50 gms.	13 ozs.
Potass bromide	3 gms.	45 grs.

These substances are pounded together with mortar and pestle until a fine powder is produced, and the mixture is stored in well-closed tubes. The above mixture is dissolved in water, 1,000 c.c.s. or 35 ozs.—"Photo-Revue," Aug. 22, 1909, p. 960; "B.J.," Aug. 27, 1909, p. 673.

Correction of Exposure with Diamidophenol.—A. and L. Lumière, as the result of testing the diamidophenol developer against pyro, have found that the former does not admit of the control recommended in the revised instructions for the development of Auto-chrome plates ("B.J.A.," 1909, p. 649). They find the best treatment for under-exposed negatives is to mix the normal diamidophenol developer with three times its volume of 5 per cent. sodium sulphite solution. In the cases of over-exposure the use of bromide is preferable to that of bisulphite. An average dose of bromide is 5 gm. per 100 ccs. of developer=24 grs. per oz.—"B.J.," Apr. 16, 1909, p. 305.

Metol Poisoning.—Dr. N. T. Beers, as the result of treating a number of cases of metol skin poisoning, states that there is no evidence that metol is absorbed into the general circulation. It is limited to parts of the body coming in contact with the solution. Cases of sores arising in other parts of the body proved to be caused by other disease mistaken for the metol poisoning. Dr. Beers advises those affected by metol to give it up. Of preventives, the best for the skin is a saturated solution of paraffin in benzine (petrol), in which the fingers are dipped before handling the metol in any form. The less severe form of metol skin disease is best treated with a soothing lotion or ointment such as:—

Lotion.

Acid carbolic	40 grs.
Powdered calamin	60 grs.
Zinc oxide	
Glycerine	
Lime water	1 02.
	4 078

The lotion may be applied during the day and a salve by night, covering the parts with a little absorbent cotton and a light bandage or glove-finger. When the disease arrives at the chronic form, where the skin peels off and a denuded area exists, the use of a soothing ointment is recommended.

Salve.

Acid salicy	ylio	15 grs
Acid boric	**********	1 dr.
Powdered	starch	2 drs.
Petrolatum	***************************************	2 oz.

If cracks form on the finger ends or the skin remains rough and scaly, use one of the above salves at night, wash off in the morning, and after careful drying apply flexible collodion with a small camel's hair brush. The collodion serves as a thorough protective during the day and allows one to dispense with bandages, glove-fingers, etc. At night a little ether will remove the collodion preparatory to applying the salve. Many chronic cases heal nicely under flexible collodion alone. Do not apply the collodion too thickly, lest it cracks and the cracks extend into the skin. Always wash off one layer with ether before applying in order to prevent cracking later.—"Phot. Times," Apr., 1909, p. 127.

A Test for Metol.—M. A. Nicolle states that commercial metol may contain paramidophenol sulphate, which interferes with the keeping qualities of the developer. The following test is described for detecting the presence of this substance:—About 1 gm. of the sample is shaken with 3 c.c.s. of concentrated hydrochloric acid. If after a few minutes the solution is not perfectly clear, paramidophenol sulphate is present. Mineral adulterants, such as sulphides, etc., may be detected by incinerating a portion of the sample; in no case should the ash exceed 0.5 per cent.—"B.J." (from "Moniteur Scientifique"), May 14, 1909, p. 374.

Pyramidol.—L. P. Clerc states that this developer, prepared by the Brugg Chemical Co., Brugg, Switzerland, dissolves to the extent of 1½ parts in 100 parts of water. A plain 1 per cent. solution will give a usable negative, but requires eighteen hours for its action. With twice its weight of anhydrous sulphite of soda added the image appears in three minutes, but full vigour is not attained under one hour. The developer thus requires an alkali in practice, and as the developer dissolves freely in alkaline solutions, it can be put up in concentrated single solution. Suitable two-solution formulæ are:—

A.	Soda sulphite, cryst	70 gms.	11 ozs.
	Pyramidol	10 gms.	90 grs.
	Water	1000 c.c.s.	20 ozs.
B.	Potass. carbonate, dry	50 gms.	1 oz.
	Water	1000 c.e.s.	20 ozs.
	or		
	Caustic potash		90 grs.
1	Water	1000 c.c.s.	20 ozs.

According to the choice of the alkali, the developer is compounded as follows:-

A, 3 parts: B, 3 parts or A, 3 parts: C, 2 parts

Water may be further added to slow down development.—"Bull. Soc. Fr. Phot.," January 15, 1909, p. 48.

FACTORIAL DEVELOPMENT.

Modified Factorial Development.—MM. Lumière and Seyewetz have advised a modified method of factorial development. They commence development with a solution containing little alkali, and, therefore, giving a longer period before the first appearance. According to the time of this first appearance they modifiy the developer and use it for a greater or less total time. The following formula answers admirably for the process:—

A.	Pyro	30 gms.	260 grs.
	Soda bisulphite (commercial solu-		
	tion)	10 c.c.s.	13 drs.
	Water	1000 c.c.s.	20 ozs.
В.	Soda carbonate (anhydrous)	35 gms.	310 grs.
	Soda sulphite (anhydrous)	75 gms.	660 grs.
	Potass. bromide	5 gms.	44 grs.
	Water	1000 c.c.s.	20 ozs.
	A, 10 c.c.s.; B, 20 c.c.s.; water,	90 c.c.s.	

This is the normal developer, and is the formula which can be used straight away for correctly exposed negatives. In order to accentuate the differences between the times of exposure of plates which have received varying exposures, only half of the normal quantity of the alkali B solution is first employed; that is to say, the developer is made as follows:

A, 1 part; B, 1 part; water, 9 parts.

The authors determined, by experiment, the relative proportions

of the two solutions, A and B, which should be used in order that the time of development of plates which have received a certain multiple of the correct time of exposure may be dealt with.

The following table, compiled as the result of these experiments, applies to the developing solutions of temperatures between 60° and 65° F.:—

Time of Appearance of First Outlines of Image, not Counting the Sky.		Degree of Exposure, i.e., Ratio of Exposure Given	After the	Total time of De- velopment Including
"Sigma" and Blue-Label Plates.	Violet-Label Plates.	to the Correct Exposure.	of the First Outlines.	Time of Appearance.
Minutes. 2·25 to 2·40 2·41 to 3·15 3·16 to 3·30 3·31 to 3·50 3·51 to 4·15 more than	Minutes. 1·55 to 2·5 2·6 to 2·20 2·21 to 2·45 2·45 to 3·10 3·10 to 3·40 4·15 to 3·40	8 times 4 ,, 2 ,, normal 1 ,, 1 ,,	20 c.c.s. A 10 ,, A nil 10 ,, B 15 ,, B 20 ,, B	Minutes. 18 18 15 12 13

For a temperature above 17° or below 15° the rule of Houdaille is used.

With this new method of development it is possible to determine, in a very approximate way, the degree of over- and under-exposure of a plate. In the case of over-exposure the correction which can be made by means of a modified developer is such that one can obtain from plates, which have received eight to ten times the correct exposure, negatives which have their contrasts almost as good as those of plates correctly exposed.—"B.J.," Jan. 1, 1909, p. 3.

TIME DEVELOPMENT.

Time Development.—Dr. E. Stenger gives a review of time development methods, including the Watkins system of correcting for variations of temperature.—"Atelier," Mar., p. 31, and Apr., p. 45, 1909.

Thermo Development—The growth of time development with the aid of a thermometer started from Hurter and Driffield's dictum that with a stated developer used at a stated temperature a fixed contrast is attained in the negative even with varying exposures. Houdaille in France, Sheppard, Mees, and Ferguson in England worked out the law which states the varying times required for varying temperatures to attain the same result. They found that

^{1 &}quot;Bulletin de la Société Française de Photographie, 1904, page 97. For each degree below or above 15 deg. add to or subtract from the total time of development to the extent of 5 per cent.

the same formula does not apply to all developers. This difference is indicated by the temperature coefficient, which is the time-ratio for a difference of temperature of 10° C. with a stated developer.

With the formula a table of times for different temperatures can be compiled for a stated plate and a stated developer. But as plates vary greatly in their development speed, another table must be compiled for another class of plate.

Watkins discovered that this formula can be graphically rendered by an even division scale for temperatures in contact with a logarithmic scale for times, and if the one scale is moveable relative to the other, they can be adjusted for different classes of plates.

There are two commercial applications of these scales. In the one (Watkins' Time Developer) a rotatable temperature scale encircles the bottle of concentrated developer, and the tempera-tures are read against the time on the log. scale. The varying times (at 60° F.) are indicated by code letters for different plates on a speed card issued with the developer, and when the scale is set to this time for 60°, the time for any other temperature can be read off. In a more recent application of the same principle (Watkins' Time Thermometer) the stem of a thermometer itself takes the place of the temperature scale, and the log. scale of time (minutes development) is placed against this. It is not convenient in a dipping thermometer to have a scale adjustable for different plates, and the scale is therefore fixed (at 6½ minutes at 60°) and necessary adjustment for different classes of plates is made not by altering time, but by altering the dilution of the developer in accordance with a table used in connection with code letters on the speed card. With such a thermometer (which has a second scale of longer times for tank development) the time is read against the top of the mercury, and it is available for several (but not all) types of developers.

For those who wish to ascertain the temperature coefficient of their own developer and to draw up a table of times and temperatures for their own use, a simple method is detailed, and diagrams provided for carrying it out, in the fourth edition of the Watkins'

Manual.

STAND DEVELOPMENT.

Stand Development with Acid Diamidophenol.—G. T. Harris, as the result of practical trials made to decide between pyro and diamidophenol for tank development on a commercial scale, recommends the latter; the formula adopted was as follows:—

Sodium sulphite	500 grs.	28.5 gms.
Potassium metabisulphite	100 grs.	5.7 gms.
	10 grs.	0.6 gm.
Diamidophenol	50 grs.	2.8 gms.
Water	40 ozs.	1000 c.c.s.

Three dipping-baths were used, each containing 40 ozs. One of these dipping-baths had 400 grs. of sodium sulphite and 200 grs. of potassium metabisulphite in place of the quantities given above,

and any plates suspected of over-exposure were first placed in the more restrained bath. The time of development in the normal solution necessary to give good printing density averaged about 10 mins.

There were no markings of somewhat less density than the rest of the plate, which sometimes appear on parts of the plate near the top and bottom of the tank when using pyro.—"B.J.," Mar. 26, 1909, p. 235.

DAYLIGHT DEVELOPMENT.

F. Jeannot and M. R. Bremner have described a solution to be used for the simultaneous development and fixation of plates and papers in daylight. It contains picrate of magnesia, or of soda, as the colouring agent. A suitable mixture is said to be as follows:—

Magnesium picrate	81 parts.
Sodium sulphite (anhydrous)	544 parts.
	250 parts.
Diamidophenol	125 parts.

This powdered mixture is dissolved in water to the extent of about 4 gms. per 100 c.c.s. (about 20 grs. per ounce), and the exposed plate or print having been placed in it in the dark, the further operation may be continued in daylight or other actinic light.—Eng. Pat. No. 15,657, 1908; "B.J.," Jan. 29, 1909, p. 88.

Potass. Iodide in Daylight Development.—A 4 per cent. solution of potass. iodide is said to be marketed in Germany under the name of "Aktinal" as a de-sensitiser of exposed plates, which latter may then be brought into daylight and development done in a metol-hydroquinone developer made up with caustic potash and fully restrained with bromide.—"Chem. Zeit.," Aug. 19, 1909, p. 878; "B.J.," Aug. 27, 1909, p. 661.

DEVELOPMENT MISCELLANEA.

One-Minute Development.—Harold Baker recommends for portraiture negatives the application of a No. 1 solution for 30 seconds, followed by treatment with the alkali or accelerator for a further 30 seconds without washing between. The solutions are:—

No. 1.	Metol	4 drs.
	Hydroguinone	8 drs.
	Potassium metabisulphite	2 ozs.
	Potassium bromide	4 drs.
	Water to	100 ozs.
No.2.	Sodium carbonate	12 ozs.
	Water	

If exposure has been on the under side the plate may remain for a shorter time in the No. 1 bath and for longer in No. 2 in order to secure full density. This is useful also in the case of strong contrasts; for a greater density with normal exposure give a longer time—say one minute—in each bath.

For over-exposure give a longer time—two minutes—in No. 1 and

shorter immersion in No. 2.

As the No. 2 solution is used it gives greater density owing to the transfer of a certain amount of developer into it, but after a few plates have been put through this gain in density drops off. Any No. 1 bath left over may be put away for re-use, but No. 2 must be used fresh for each batch of plates.

The method effects a saving of time and of developer, gives results with more detail, especially in the shadows, and obviates a certain amount of retouching. Although not suited for every plate, it works admirably with the "Zenith," which plate is very highly commended by Mr. Baker for portrait work .- "Phot. Scraps, Aug., 1909, p. 57; "B.J.," Aug. 6, 1909, p. 609.

Brush Development.—R. W. Phillips recommends the following procedure for portrait negatives, using the three-solution (A, B, C) Seed developer. Two solutions are made up, one the regular 1 oz. of each to 8 or 10 ozs. of water, as you would in developing straight; the other with the carbonate separate from the pyro and sulphite by making up a solution in regular quantities of pyro and sulphite with the regular amount of water. Then use a solution of one-half carbonate and half water, or two-thirds carbonate and one-third water, whichever is found to suit the strength of negative desired. In the case of a negative exposed with a subject in white drapery, develop the plate until the general composition is apparent on the surface of the plate, then pour off this regular developer and wash the plate. Now pour on the pyro and sulphite solution, previously made up, and hold the negative up to the light in the hand, flat, then use a brush, or soft cotton, saturated with the carbonate solution, and rub over that portion of the negative which you wish to bring out the most prominently. This must be done the first time very quickly, placing the negative immediately back in the solution, and then repeat the operation, blending the carbonate well over the plate so as not to get streaks.

The principle involved is this: The negative is developed only to a slight extent in the first immersion, and as soon as the pyro and sulphite solution is poured on, development practically ceases. Then you control the accent of high-lights absolutely with your carbonate solution. Considerable practice will have to be had in most cases before you become master of this form of local work. Under-expose rather than over-time negatives for brush development, as the fulltimed negative is much harder to control. In developing a 10 x 8 plate use a 1-in. camel's hair brush for the first brushing, going all over the plate with this, twice over the parts to be accented to once over the other part of plate. Then a brush less than half the size also of camel's hair can be used for pointing up .- "Bull. Phot.,"

Oct. 28, 1908, p. 278; "B.J.," Nov. 13, 1908, p. 865.

Pure Soda Sulphite.-H. Hartley and W. H. Barrett have described a method of preparing anhydrous soda sulphite in a state of complete purity: -Into a solution of pure sodium carbonate of

suitable and known strength a current of sulphur dioxide was passed until the increase in weight showed that the conversion into sodium-hydrogen sulphite was complete; whereupon a quantity of sodium carbonate solution equal to that originally used was added. On heating to a temperature a little over 212° F the anhydrous salt was deposited, and a further yield was obtained by evaporating the solution in a stream of hydrogen. It appears probable that by slightly modifying the method a commercial product might be obtained of high purity and nearly free from sulphate. The authors confirm MM. Lumière's conclusions that pure anhydrous soda sulphite does not deteriorate by oxidation in the air.

The solubility of the anhydrous or true salt varies very little with the temperature, but the solubility of the crystallised (heptahydrate) increases rapidly as the temperature is higher. Thus a saturated solution prepared at 99° F. contains 44 parts by weight of anhydrous sulphite in association with 100 parts by weight of water. If instead of this we take a solution saturated at 65° F. the composition will be 25 of the true sulphite and 100 of water.

As 65° F. may be looked upon as sufficiently near to the "ordinary temperature," we may take it that according to the determination of Hartley and Barrett a saturated solution prepared under usual conditions will contain 4 of water and 1 of true sulphite, or 3 of water and 2 of the crystallised sulphite.—"B.J." (from "Journ. Chem. Soc."), Aug. 20, 1909, p. 643.

After-Treatment of Negatives.

REMOVING STAINS.

Removing Silver Stains.—A method which, used with a little skill, involves no risk to the negative is as follows:—The negative is re-fixed in a bath made up with hypo, alum and sulphite, in which the gelatine will lose its adhesiveness and allow of any portion of the print which may have stuck to it being removed. It is then thoroughly washed and dried, and laid on a perfectly flat base, such as a piece of plate glass covered with two or three thicknesses of paper. If now nrmly rubbed over with a tuft of soft cotton wool moistened with methylated spirit, the stain can be completely rubbed off, but the pressure needs to be hard and the movement circular, as in applying retouching varnish.—"B.J.," Apr. 9, 1909, p. 278.

Removing Oxidised-Developer Stain.—R. E. Blake Smith first converts the silver image into chloride by means of a solution of potassium bichromate, sodium chloride and sulphuric acid, and then oxidises the stain (caused by oxidised developer) by means of acid permanganate solution: the silver chloride image not being affected by this latter. The deposit of manganese peroxide is removed with a solution of sulphite made acid with sulphuric acid, and then after further washing the image is re-converted into the metallic state by means of a "developer" of metol, soda sulphite and soda carbonate.

The following are the solutions employed	-	
Potassium bichromate	65 grs.	15 gms.
Conct. sulphuric acid	400 mns.	90 c.c.s.
Common salt	l oz.	100 gms.
The negative is washed till no yellow colour	10 ozs.	1000 c.c.s.
immersed for between five minutes and a qui		
Potassium permanganate	6 grs.	2.7 gms.
Sulphuric acid conet.	30 mns.	
Water		1000 c.c.s.
It is then washed in running water for two then treated with	or three i	ninutes, and
	6 grs.	4.3 gms.
Conet. sulphuric acid		5.8 c.c.s.
Water		1000 c.c.s.
The potassium permanganate bleaches out the leaves in its place a manganese one, and the	his is reme	oved by the
sulphurous acid.		
The negative is now washed for about to	en minutes	in running
water, and then redeveloped with	30 grs.	6.8 gms.
Sodium sulphite	90 grs.	20 5 gms.
Sodium carbonate	1 oz.	100 gms.
Water	10 ozs.	1000 c.c.s.
—В.J.," Feb. 5, 1909, р. 100.		

INTENSIFICATION.

Intensification of Dry-plates with Silver.—In order to obtain a silver image in a state readily amenable to physical development with an acid solution containing silver nitrate and a developer such as pyrogallic acid, R. E. Blake Smith directs that the negative, after soaking in water, be bleached in a mixture of potassium bichromate, sodium chloride, and sulphuric acid, washed again, the last traces of bichromate removed with acid solution of sodium sulphite, and the plate, whilst still wet with this solution, exposed to diffused daylight for about an hour.

The formulæ for these two solutions are:-

Potassium bichromate	65 grs.	19.4 gms.
Conet. sulphuric acid	400mns.	90 c.c.s.
Common salt	l oz.	
Water	10 ozs.	1000 c.c.s.

and after bleaching is complete it is washed. The bleaching solution keeps well, and after use it should be poured into a bottle, corked up, and stored for future employment.

The bleached negative, after all the bichromate solution has been

washed out of it, is put into a dish containing

Sodium sulphite (cryst.)	15 grs.	6.8 gms.
Conct. sulphuric a	icid	25 mns.	11.4 c.c.s.
Water		5 ozs.	1000 c.c.s.

It is then washed briefly, and either forthwith intensified or first redeveloped with a metol developer, the latter course being preferable on account of it then being easier to judge intensification exactly. After redevelopment the plate is washed for a few minutes, given a bath of 1:200 hyrochloric acid to remove deposit of lime salts due to the washing water, and again washed. It is then intensified in a solution of

Pyrogallie acid	23 grs.	1.25 gms.
Silver nitrate	9 grs.	4·1 gms.
Citric acid	70 grs.	32 gms.
Water (tap)	5 ozs.	1.000 c.c.s.

until of the required density. Should any yellow stain appear on the negative a momentary immersion in the bleaching bath of bichromate, sodium chloride, and sulphuric acid will at once remove it without reducing the silver image.—"B.J.," Jan. 29, 1909, p. 82.

Stains in Chromium Intensification.—Sometimes when a plate is put through the chromium intensification process the final result shows brown stains, especially where finger marks existed on the original. These stains, particularly when due to the existence of grease on the negative, are easily removed if the plate is first soaked in a solution of sulphite of soda and hydrochloric acid, and then rubbed with a wad of cotton wool. The slighter stains will rub off immediately, while the stronger ones will yield to two or three applications of the solution. Incidentally the solution will slightly reduce the intensification obtained, and for this reason it is better to soak the whole plate than to merely apply the solution locally. The reduction is, however, not very great in any case, unless a great deal of acid is used, and three or four drops in 2 ozs. of 5 per cent. sulphite solution are usually quite enough.—
"B.J.," June 18, 1909, p. 470.

REDUCTION.

Reducing by Re-development.—R. E. Blake Smith recommends the following as a method of reduction when it is required to reduce the darker parts of the negative without affecting the lighter ones. The negative is bleached in

Potass. bichromate	65 grs.	19.4 gms.
Sulphuric acid, concentrated	400 mns.	90 c.c.s.
Common salt	1 oz.	100 gms.
Water to	10 ozs.	1000 c.c.s.

This bath is diluted with three or four times its volume of water for use.

The negative is allowed to remain in the diluted bath until the lighter portions are completely bleached and the darker portions partly so, these latter being left with an amount of unchanged silver in them corresponding with the degree of reduction desired. After washing, the plate is put in a reducing bath, which will not dissolve the silver chloride. For this purpose the acid permanganate reducer

or the Lumière ceric sulphate reducer may be used, after which, and a further wash, the negative is re-developed in

Metol	
Sodium sulphite, cryst 45	grs. 20.5 gms.
Sodium carbonate, cryst	z. 100 gms.
Water 5 o	
Phot " Feb 2 1000 n 08	

Soft-Working Farmer's Reducer.—R. Namias has stated that bromide added to the Farmer's reducer, as suggested by Piper ("B. J. A.," 1909, p. 587), actually increases the contrast of the negative instead of reducing it. His results, however, were obtained with a solution about one-tenth the strength of that employed by Piper. "Phot. Couleurs," Apr., 1909, p. 87.—"B.J.," May 14, 1909, p. 374.

Reducing with Persulphate by Time.—R. B. Hughes recommends treating the negative with a solution of ammonium persulphate containing 12 grs. of persulphate and 2 drops of sulphuric acid per ounce on a time basis. A note is made of the time which elapses between the first application of the solution and the first appearance of the milkiness which marks the commencement of reduction. A total period of four times this period of "first appearance" will then give an average amount of reduction. The negative should be soaked in water for fifteen minutes before reduction, and the Jish should be rocked whilst treating with the persulphate. Two successive treatments in this way are said to be as much as any negative can stand.—"Phot. Monthly," Sept., 1909, p. 207.

NEGATIVE VARNISHES.

De-varnishing Negatives.—A very effective solution for removing shellac varnish from gelatine is made as follows, being based on the solubility of the varnish in the spirit and the power of ammonia or a strong caustic alkali to prevent precipitation of the shellac when the negative is placed in water:—

 Caustic potash
 1 oz.
 100 gms.

 Methylated spirit
 10 ozs.
 1000 c.c.s.

The plate is soaked in this until the varnish has apparently all gone. A second bath may be then applied for a few minutes, when the plate can safely be washed under the tap.

If the plate is to be intensified with mercury, it is better to use 1 oz. of ammonia, 0-880 in place of the caustic potash, as it is more

easily washed out.—"B. J.," Oct. 30, 1908. p. 826.

Reproducing Negatives.

Quality in Enlarged Negatives.—Dr. D'Arcy Power, in an article on the relative merits, as regards result and convenience, of methods of making enlarged negatives decides in favour of that in which a perfect P.O.P. print from the negative (he uses Solio paper) is made, and, without toning or fixing, enlarged on to a slow plate or thin bromide paper, which latter is then converted into an ozobrome to the improvement of its gradation. The untoned and unfixed P.O.P. print is, of course, photographed by artificial light, preliminary

focussing having been done with a piece of newspaper in the place of the print. A plate of medium rapidity, such as the 26X Seed, or a smooth "platino"-bromide paper is used for the enlarged negative, and a rather weak developer of the metol class employed. In the case of the improvement of the paper negative mentioned above, the negative enlargement is used to give an ozobrome which is developed in contact with it by the ozobrome No. 1, or non-transfer, process, using a tissue, or "plaster," of engraving black. The result is found to be a negative of full density in the high-lights, good shadow detail, and with very little granularity owing to the filling of the pores of the paper by the gelatine. Dr Power's method is probably as cheap as any.—"Cam. Craft," Jan., 1909, p. 2.

Enlarged Paper Negatives Direct.-W. L. G. Bennett uses the following ingenious method of preparing an enlarged negative direct. The minimum exposure is given to the bromide paper and development stopped at the point that would be right for a positive enlargement. The paper is then washed for about two minutes, and, still unfixed and in the dark room, toned in a uranium toning bath. White light may be used for an instant to judge of the progress of toning. The latter is done in a strong bath for about five minutes or for ten minutes in the case of a print with very deep shadows. Longer will do no harm. The toned print is then washed in several changes of water and placed for one minute in

Ammonium sulphocyanide 20 grs. Water 10 ozs. 1000 c.c.s. It is then well washed for another two minutes. The print is laid face up in an empty dish and exposed to 4 inches of magnesium ribbon burnt about 2 feet distant. The print is then put back into the original developer, which destroys the uranium image (owing to the alkali in it), and at the same time develops a negative image printed on the underlying emulsion by exposure to the magnesium.— "A.P.," Aug. 24, 1909, p. 181.

See also "Contact Copies of Plans, etc.," under "Copying."

Duplicate and Reversed Negatives .- Dr. E. Stenger gives a lengthy review of the methods available .- "Zeit für Repro," Mar., 1909, p. 34.

Film Photography. NEGATIVES ON FLEXIBLE SUPPORTS.

Translucing Paper Negatives .- J. M. Sellors, in a paper before the Croydon Camera Club, stated that of the three methods of applying wax to a paper negative, namely: (1) By rubbing a hot iron over the paper with a lump of wax in contact with it; (2) by placing the negative film side down on a hot plate, and rubbing a lump of wax over it; and (3) by employing a shallow tin tray containing a thin layer of melted wax, kept fluid by placing the tray in a dish of boiling water, the negative being floated on to the wax, film up-the first was found to result in streaks and lines owing to uneven absorption of the wax. The third method was satisfactory, the negative being afterwards ironed in order to remove any wax which came in contact with the emulsion side. - "B.J.," Apr. 16, 1909, p. 300.

V.—PRINTING PROCESSES.

POSITIVES DIRECT.

Copies by Reflected Light by Contact (Playertype).—See "Contact Copies of Plans, etc.," under "Copying."

Printing Methods and Accessories.

Strong Prints from Weak Negatives.—A. H. Hall, in comparing practicable methods for getting a vigorous print from an extremely weak negative, suggests as the easiest method the making of a weak gaslight print, i.e., to give an exposure that is too short to obtain full density, but long enough to give full detail without veiling, and to intensity by the well-known bichromate method, followed by re-development with amidol. For the development of the print, in the first case well-restrained pyro-soda is best. Development will be somewhat slow, and unless the negative is quite abnormally thin, full density can often be obtained without any further manipulation. The print may be of a pleasing sepia, but is more likely to be a most unpleasant greenish black. It is, therefore, better to stop development before full density is obtained, and intensify as suggested above, when the resulting print will be found to be a pleasing black.

A method that gives even finer results, but is rather more trouble, is to make a weak print, harden it, and make an ozobrome on top of the image so formed. The print should then be dried, and when dry, the underlying image can be re-developed with amidol or toned in the sulphide bath. Very fine results can be obtained by this means. A sepia bromide on a print that has been re-developed with amidol gives a very fine warm black. The secret of both these methods is to get a print in the first place that has no signs of veiling, yet is as strong as possible. This entails several trials to get the exact exposure.—"A.P.," Dec. 1, 1908, p. 527.

Pipe Dream Photographs.—W. R. Barefoot recommends as a business novelty for the portrait studio a form of vignetted photograph in which the head of the sitter is represented as forming part of the cloud of smoke from a tobacco pipe. This is done by first vignetting the head near the top of a 9 × 14 sheet of paper—

best, platinum paper. The pipe itself is printed towards the bottom of the same sheet. The print having been developed, fixed and dried in the ordinary way, the cloud or smoke effect rising from the pipe and enveloping the head is etched in with a piece of absorbent cotton and graphite, being softened off with ordinary soft rubber.—
"St. L. and C. Phot.," Feb., 1909, p. 102. "B. J.," May 14, 1909, p. 383.

Washing Under the Tap.—The following dodge will be found to allow of more efficient washing being given to a batch of prints which are washed by allowing the tap to run on them as the prints lie in a dish :- Select a dish in which the sides slope outwards very slightly. The majority of porcelain dishes have the requisite slope, and the only ones not suitable are those with quite vertical sides. Arrange the dish so that a fairly strong stream of water falls vertically on the centre of one of the shorter sloping sides. If the water in the dish is stained a port wine colour with permanganate, it will be found that the whole of the colour in a 10 x 8 dish will disappear in two minutes or less. This is the test for efficiency in changing the water. Then place twenty or thirty quarter-plate prints in the dish. If the water is running with a sufficient force, the whole will keep constantly on the move, each print continually changing its position, and never clinging to any other print. "B.J.," July 30, 1909, p. 586.

Photographic View Postcards.—C. W. Jerome, in recommending the making of view postcards as a profitable branch of photographic business, gives suggestions as to the most suitable subjects and the best methods of turning out high-quality cards.—"Wilson's," Apr., 1909, p. 171. "B.J.," Apr. 23, 1909, p. 323.

Adjustable Vignetter.-H. E. Corke describes a form of vignetting card, the method of preparing which allows of very nice adjustment of the negative, while at the same time it leaves the negative untouched. Place the negative in a printing frame as usual, and as a precaution firmly attach the negative to the printing frame with small pieces or strips of gummed paper. Then take a piece of thin cardboard and cut a hole in the centre, just as in making an ordinary serrated shape, but pay no regard to the actual shape of the hole, which should, however, be a good deal larger than the actual size of the proposed vignette. This card is then attached to the front of the printing frame with drawing pins. Next paste a piece of tracing-paper over the hole, procure some opaque paint, such as yellow ochre or Indian-red, and mix into a thick cream with water and ordinary office gum. Then, while holding the printing frame up to a window or to a gas flame, and looking through the negative, as if using a retouching desk, we can apply the paint to the tissue-paper, working backhanded, as it were. It will thus be seen that the utmost precision is possible as to the actual shape. The edges of the vignette can be made to register more softly by either applying the innermost line of paint less thickly or by making uneven brushmarks, similar to rough serrations. For

the purpose of local control of printing density also, this same method is extremely valuable. Any part of the negative which prints too darkly can be effectively restrained by the application of a dab or two of colour on the tracing-paper.—"A. P.," Mar. 23, 1909, p. 280.

Panoramic Views from Several Negatives—R. A. Towers, in making one long panoramic print from a series of negatives specially taken for the purpose, directs cutting a slot with a keyhole saw in the end of the printing frame so as to enclose the projecting portion of the long strip of paper in a bag or envelope (Fig. 1). In order

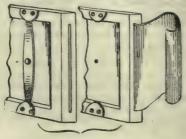


Fig. 1.

to combine the negatives in such a way that the joins do not show, cards of the saw-like pattern shown in Fig. 2 are fixed to each side of the frame. The printing is done in the shade or under two thicknesses of tissue paper pasted over the front of the frame. This method will allow of the separate pictures being combined



Fig. 2.

without showing any sign of join. It is necessary in taking the negatives that at least one inch of the subject should overlap on each negative, otherwise an even join cannot be obtained. The negatives are, of course, all taken with the same focus lens, and in dividing up the subject it is well to choose spots where the out-

lines are irregular—that is to say, trees in preference to buildings, when, as is usually the case, both occur in the subject. The method is applicable to developing papers as well as to those which print out; in the former case the adjustment is made by ruby light, a light sketch of the outline being pencilled on the back of the paper at the point of junction as well as of the masked off edges at top and bottom. A similar method may be used when enlarging, but in this case a pencil may be used lightly on the surface of the paper, the marks being easily removed from the wet paper with the finger.—"Cam. Craft," Feb., 1909, p. 43; "B.J., Mar. 19, 1909, p. 214.

Plain Paper.

Plain Paper for Black und Brown Tones.-Dr. C. Stürenburg

gives the following formulæ:-

For a paper which shall give a black tone 10 gms. of sodium phosphate and 20 gms. of gelatine are dissolved in 1,000 ccs. of water. To this warm solution 10 ccs. of a 5 per cent. solution of shellac in alcohol are added. The paper to be used is dipped in this warm solution and removed and hung up to dry as soon as the liquid has penetrated it. In place of immersion the solution may be applied with a brush, and the dried paper can be kept for any length of time. In order to sensitise it the following silver bath is prepared:—

Silver nitrate	120 gms.	105 grs.
Boric acid	10 gms.	88 grs.
Potass. chlorate	20 gms.	176 grs.
	1000 c.c.s.	20 ozs.

The paper is floated on this bath for about five minutes and hung up to dry. Printing takes place very quickly, and the prints are then washed and placed in a plain bath of hypo of 10 per cent. strength, again washed and dried.

A second method (for brown-toned prints) is as follows :-

Soft gelatine	10 gms.	154 grs.
Ammonium chloride	6 gms.	93 grs.
Sodium carbonate	2 gms.	31 grs.
Borax	11 gms.	170 grs.
Sodium phosphate	6 gms.	93 grs.
Potass. bichromate, 10 per cent. solution	3 drops	3 drops
Water	300 c.c.s.	101 ozs.

The above proportions give a deep brown tone. For a black tone only 8 gms. (125 grs.) of borax should be taken and 9 gms. (140 grs.) of sodium phosphate. For sepia tones the proportions should be borax 15 gms. (½ oz.), sodium phosphate 2 gms (30 grs.).

This warm solution is applied freely to the paper by means of a brush, the paper being pinned to a board. After drying, the paper is sensitised in:—

Silver nitrate		15 gms.	doz.
		15 gms.	
Distilled water	r	240 c.c.s.	81 9ZS,

Ammonia is added drop by drop to this bath until a slight permanent precipitate is produced. The bath is then exposed to light until the precipitate has settled and is then filtered. The paper may be sensitised by liberal application of the solution with brush. In its sensitive condition the paper will keep a few days. It may be fairly deeply printed, and the prints then given a few minutes in a 3 per cent. solution of salt, rinsed, and fixed in hypo solution containing 180 gms. hypo per 1,000 ccs. of water (3,00s. in 20 ozs.). This is followed by the usual washing.—"Der Phot.," Apr. 13, 1909, p. 117; "B.J.," May 14, 1909, p. 382.

GELATINE AND COLLODION P.O.P.

GELATINE P.O.P.

EMULSIONS.

Contrasty P.O.P. Emulsion.—A patent of the Chemische Fabrik auf Actien (E. Schering) describes the preparation of a P.O.P. emulsion suitable for the making of strong prints from very weak negatives. In place of the chromates or ferricyanides used for such papers a salt of vanadic or phospho-vanadic acid is used with the advantage that the paper is white, not of the yellow-brown colour of emulsions containing the above-mentioned compounds. The white paper allows of printing being readily judged. The print is treated as usual in a toning and fixing bath.

An emulsion may be made by successively stirring in thin streams of the three following solutions in order into a solution of 150 gms.

of gelatine in 1,400 ccs. of water.

1.	Citric acid	35 gms.	14 ozs.
	Sodio-potassium tartrate (Rochelle salt)	3 gms.	46 grs.
	Water	150 c.c.s.	$5\frac{1}{4}$ ozs.
	Ammonium vanadate	2 gms.	30 grs.
II.	Ammonium chloride		½ oz. 1¾ ozs.
III.	Silver nitrate	50 gms. 200 c.c.s.	13 ozs. 7 ozs.

The ammonium vanadate in the example may be replaced by from 3 to 5 gms. (46 to 80 grs.) of ammonium phosphovanadate if this substance be used.—Eng. Pat. No. 9,275, 1908; "B.J.," Jan. 8, 1909, p. 28.

Emulsion for both Development and Printing-out.-W. H. Caldwell has patented the addition to an ordinary gelatino-bromide or chloride emulsion derivatives or salts of hydrazine or hydroxylamine, with the object of providing substitutes for the organic salts of silver (halogen absorbents) in a print-out emulsion, and at the same time of allowing of the emulsion being developed in the ordinary way (presumably with an alkaline developer). A suitable addition to the prepared and boiled emulsion is neutral hydrazine sulphate. hydrazine phosphite, sulphite or other easily oxidisable salt of hydrazine. In making these salts a solution of the acid is added to hydrazine hydrate, using methyl orange as an indicator of the neutrality. In the case of chloride emulsions which require only a mild halogen absorbent, a sulphite of a base such as methyl hydrazin is used. In emulsions containing the more stable silver bromide, a more active compound such as hydrazin phosphite is used. The proportion added is based on the fact that each molecule of hydrazin hydrate is able to reduce four molecules of silver haloid. Plates or papers prepared with ordinary emulsions may be treated with a bath of the hydrazine or hydroxylamine compound.—Eng. Pat. No. 1689, 1908; "B.J.," Feb. 19, 1909, p. 145.

TONING P.O.P.

Thiocarbamide Toning Baths.—A. and L. Lumière have attempted to use thiocarbamide and thiosinamine as substitutes for hypo in combined toning and fixing baths, the object being to avoid the liability to impermanent results caused by decomposition of the hypo. It was found, however, that thiocarbamide attacks the gelatine, and therefore cannot be used in stronger solution than 6 per cent., although its action is to some extent counteracted by addition of alum. The chief drawback is that traces of either thiocarbamide or thiosinamine in the print are decomposed by the alkali present in most tap waters. If such combined baths are used it would be necessary to wash prints first in distilled water or in 1-10th per cent. acetic acid. The best toning bath was found to be one containing only:—

Thiocarbamide		
		265 grs.
Gold chloride		
Water '	1000 c.c.s.	20 ozs.

This toned in six minutes, and did not work so well with addition of a lead salt, which altered the half-tones of the prints.—"B.J.," Oct. 9, 1908, p. 776.

Thiocarbamide Combined Bath.—Dr. C. Arnold recommends the following formula as the simplest and a most reliable one for a combined toning and fixing bath:—

Thiocarbamide	10 gms.	88 grs.
Hypo	200 gms.	4 ozs.
Water	1000 c.c.s	. 20 ozs.

Gold chloride is added in the requisite proportion, say, 2 grs. of gold per 20 ozs. of bath. The bath gives reddish to black tones according to time of immersion, and prints may be left in it for any reasonable time without detail suffering.—"Phot. Mitt.," Heft 11, 1909, p. 174; "B.J.," July 9, 1909, p. 526.

R. E. Blake Smith points out that it is quite safe to wash prints toned in the above bath in ordinary tap water, so long as the hypo is greatly in excess of the thiocarbamide. There is no need to employ a weak acid bath for the first washings, since no silver-

thiocarbamide compounds are formed in the prints in normal circumstances. This may not be the case if the bath has taken up much silver.—"B.J.," July 16, 1909, p. 562.

Fixing Prints before Toning in the Combined Bath.-R. Namias recommends the fixation of prints before toning in any combined bath on the grounds of greater permanency and regularity of working. The fixing bath advised is the following:-

Нуро 300 gms. 6 ozs. Boric acid. 50 gms. 1 oz. Water 1000 c.e.s. 20 ozs.

A good P.O.P. print will be fixed in three or four minutes, and will not be weakened any more than when using the combined bath in the ordinary way. The latter bath tones fixed prints rather more slowly, but the silver finding its way into the bath is so small that it does not affect the action until several hundred prints have been fixed, as compared with dozens in the ordinary way. The bath thus keeps much better, does not darken, and gives a full toning action on occasional strengthening with gold chloride solution.—Eder's "Jahrbuch," 1908, p. 72; "B.J.," Nov. 20, 1908,

Combined Bath for Ilford P.O.P.-H. W. Bennett recommends the following formulæ and method for the preparation and use of a combined bath giving very rich purple and permanent tones with Ilford printing-out paper.

Each constituent of the bath will keep in solution satisfactorily for a very long time :-

	9 8		
A.	Нуро		500 gms.
	Wa'er, sufficient to make	32 ozs.	1000 c.c.s.
В.	Ammonium sulphocyanide	2 ozs.	57 gms.
	Water to	81 ozs.	230 c.c.s.
C.	Lead acetate	1 oz.	28 gms.
	Water to make	81 ozs.	230 c.c.s.

The lead acetate should be dissolved in very hot water, as nearly boiling as possible. The solution will be cloudy, and should be shaken up before measuring out any quantity required.

D. Gold chloride	
Water	3 ozs. 85 c.e.s.
E. Ammonia (·880)	
Water	10 ozs. 280 c.c.s.

To prepare the toning bath, take 3 ozs. (85 c.c.s.) of A and 3 drs. (10 c.c.s.) each of B, C, D, and E, and add sufficient water to make the total quantity up to 10 ozs. (280 c.c.s.). This quantity of bath is sufficient for eight whole-plate prints, for fifteen halfplate, or for thirty-two quarter-plate.

It is very important that the solutions should be mixed in the order of the letters of the alphabet. The necessary quantity of A should be taken first, B added next, then C, and so on. After measuring C, the measure must be thoroughly rinsed before using

it for D, and again thoroughly rinsed before measuring E.

The minimum time for the prints to remain in the bath should be twelve minutes. This is most important to ensure perfect fixation,

and, consequently, stability.

Very deep printing is necessary for toning and fixing in this bath. The tone is judged as the prints lie in the solution, the final colour being that which they have at the time of being taken from the bath. "Phot. Scraps," Feb., 1909, p. 11; "B.J.," Feb. 5, 1909, p. 104.

THIOMOLYBDATE TONING.

Sepia Tones with Thiomolybdate. Harry E. Smith has found that the thiomolybdates patented by him for use in sulphide toning of bromides (see under "Toning Bromides") serve well for the toning of print-out papers. Prints on these latter are first fixed in hypo, in which they become a yellowish-brown colour, washed and then treated with the toning bath of about is per cent. strength of thiomolybdate. They are then immersed, after rinsing, in a weak ammonia bath-

 Ammonia, 0.880
 3 to 5 c.c.s.
 ½ to 1 oz.

 Water
 100 c.e.s.
 20 ozs.

-for about two minutes to clear the whites of the picture. A final

wash of fifteen minutes completes the process.

With most papers it is best to wash the print before fixing in running water, and then to give them a few minutes in a 10 per cent. bath of common salt, again washing before passing to the hypo bath.—Eng. Pat. No. 12,341, 1908; "B.J.," Mar. 19, 1909,

H. E. Smith has further improved this process by placing prints from the frame in a bath of ammonium phosphate and ammonium carbonate. This prevents any possibility of the high-lights yellowing in time, although even without this precaution many papers will not show this defect. The bath is prepared as follows:—A stock solution of ammonium carbonate is first made:—

A.—Ammonium carbonate	400 gms.
Cold water	1.800 c.c.s.
	600 c.c.s.
The state of the s	000 0.0.8.
The phosphate-carbonate bath is:	
Ammonium phosphate tribasic (10 per cent.	
propries or per contr.	

Sol.) 3 parts.
Ammonium carbonate, A sol. 1 part. This is allowed to act for ten minutes, and prints are then put straight into hypo fixing bath made as follows:-

After having been fixed for fifteen minutes, prints are washed for one hour and toned in the thiomolybdate bath prepared from the "Cubrome" thiomolybdate of Edmund and Co.—"Phot. Journ.,"
Aug., 1909, p. 330; "B.J.," Aug. 20, 1909, p. 646.
Although tri-basic ammonium phosphate is a commercial salt, it is sometimes difficult to obtain, and may then be prepared, as

directed by H. E. Smith, as follows:-

Dissolve the ordinary ammonium phosphate in cold distilled water nearly to saturation, and then add excess of 0.880 ammonia. After standing a short time, the contents of the flask, after being shaken up, is thrown on a Buchner funnel, when the precipitated salt is dried as far as possible by suction with the filter pump. The salt in this state (a somewhat pasty crystalline mass) is dissolved (1-10) in distilled water. To every 3 parts of this solution 1 part of the ammonium carbonate solution is added to make the alkaline phosphate bath, as already described above.—"B.J.," Aug. 27, 1909, p. 678.

[The use of thiomolybdates and allied salts for bromide and gaslight prints, etc., is patented, and the use of these salts for toning P.O.P. is also separately patented thus as mentioned above. The thiomolybdate solution must be obtained from the proprietors of

the patent, Messrs. Edmund and Co., Ed. B.J.A.]

DEVELOPING P.O.P.

"Ensynoid" Developer for P.O.P.—J. Peat Millar finds that the "Ensynoid" liquid developer, 4 drops in 1 oz. of water, or a developer made by dissolving one A and one B "Ensynoid" tablet in 32 ozs. of water, forms a developing solution for faintly printed "Imperial" or "Ilford" P.O.P. Prints developed up well without surface stain, though with markings on the backs. The developer brings up the prints to full vigour, but the tone after fixing is of disagreeable greenish colour, which can, however, be modified by gold toning.—"B.J.," July 9, 1909, p. 537.

Carbon Surface on P.O.P. Prints.—W. Findlay mentions a precaution that should be taken in using formaline for hardening gelatine prints which are to be squeegeed on to and stripped from ground glass. The formaline bath should be given to the prints immediately before squeegeeing, otherwise, if the print partly dries before squeegeeing its surface is so altered that it will not assume the silky carbon-like appearance on stripping from the ground glass. —"Photo-Era," Jan., 1909, p. 26.

Impure Alum and P.O.P.—A sample of alum found by a correspondent of the "B.J." to cause pronounced eating out of the high-lights of a P.O.P. print, which had been toned in the separate gold and sulphocyanide baths, whilst in the case of a print toned in the combined bath the image was almost removed, was found to be contaminated with iron salt. The iron existed in both the ferrous and ferric states, the latter no doubt giving rise to the reducing action.

—"B.J.," July 16, 1909, p. 546.

Collodion P.O.P.

Platinum-Gold Toning.—Dr. G. Hauberrisser recommends the use first of a platinum bath of the usual kind, followed (after thorough washing) by combined toning and fixing in a solution prepared as follows:—

Gold toning	and fixing	salt,	Bayer	1 oz.	50 gms.
Нуро				l oz.	50 gms.
Water				15 ozs.	750 c.c.s.

Here the prints remain at least 8 minutes, during which time they attain a pure black tone. They are finally washed for an hour or more.—"Phot. Rund.," Heft. 15, 1909, p. 184; "B.J.," Aug. 27, 1909, p. 668.

Phosphate Printing Papers.

ENSYNA PAPER.

This quite new description of photographic printing paper was placed upon the market by Messrs. Houghtons immediately after the date of publication of the 1909 "Almanac." Although worked by gaslight the paper is quite distinct from the numerous "gaslight" papers. As stated on the packages, it is made in accordance with the patents of York Schwartz, Nos. 9,993, 1908, and 9,855, 1907 ("B.J.A.," 1909, p. 599). Developer is issued under a patent of J. H. Mallabar No. 13,032, 1905 ("B.J.A.," 1907, p. 784). The basis of the paper is silver phosphate, the invisible image on which is developed by a physical developer. Thus, an ordinary "gaslight" developer is quite useless for "Ensyna," which is more akin in its method of treatment with the wet collodion plate. As regards, however, the practical facilities which the new paper provides, it may be said that "Ensyna" gives the effects of P.O.P. (in a more permanent form) by the "gaslight" method. But as it is much more rapidly finished off than a gaslight paper, and as it dispenses with gold or platinum toning, it is more to the point to say that it gives (by gaslight) prints which resemble (but have greater claims to permanence than) those on self-toning papers, by a method of production which is as expeditious as the "development" and clearing of platinotype prints. The salient features of the paper are (1) the great range of tone given by it from bluish-black through brown and sepia to a Bartolozzi red, (2) the fact that the only effect of over-exposure is to give the print a warmer tone, and (3) the very soluble nature of the film, which allows of fixing being complete in half a minute and the final washing in 2 minutes. In addition to the above the image, since it consists of developed silver, has every claim to be regarded as fully permanent. The rapidity with which a single print may be taken off on "Ensyna" may be thus shown :-

Total			min.			
Washing			min.			
Fixing			min.			
Development	say	2	min.	0	sec.	
Water bath			min.			
Exposure	say	0	min.	30	sec.	

The method advised by the makers is to cover the paper first with water until it is limp, to then pour off and apply a small quantity of the developer, which is used to bring the print to a point a little short of full vigour and is then thrown away. A little water is then again poured on and the print removed when it has reached the desired strength, being then transferred to the fixing bath, which may be of plain hypo, but is preferably of the "acid" variety.

Owing to the speed of fixing, the print is ready for removal almost immediately, so that working in this way there is only one print at a time in the hypo bath. Longer washing than two minutes does not in any way injure the print, but this brief period is described by the makers as sufficient, not, we imagine, because every minute trace of hypo is removed in this time, but for the reason that the developed silver image is unaffected by faint residues of a fixing salt in the paper. This claim is certainly confirmed by the well-known immunity of properly "xed bromide prints to hypo which is left in them owing to a very brief washing. By dipping an undeveloped piece of "Ensyna" in the fixing bath the great solubility of the emulsion will be seen from the almost instantaneous disappearance of the yellow colour. On allowing the sheet of paper to lie in the air the portion dipped in the fixer will show no discoloration, except at the line of junction with the unimmersed portion. Here the local excess of silver causes decomposition and separation of silver sulphide, but the test shows the rapidity of action of the fixing bath and bears out what one would expect from the great solubility of silver phosphate in hypo solution.- "B.J.," Dec. 11, 1908, p. 951.

A new brand of the paper was issued under the name of "Vigorous" Ensyna by Messrs. Houghtons in August, 1909. It gives prints of greater contrast, whilst at the same time considerable over-exposure results in a softer print of warm tone being obtained. The new brand is thus more suitable for negatives of widely

different character.—" B.J.," Aug. 6. 1909, p. 616.

Fixing Exposures for a Given Colour .- W. Foster Brigham, in some notes on the professional use of "Ensyna" paper, recommends that a good clear average negative be chosen as a specimen, and from it a series of ten prints made with exposures, at one foot from the incandescent burner, of ten to one hundred seconds. These are mounted in their consecutive order and hung in the printing-room. If we wish to get an exact shade of colour from any negative, we note how many seconds the average negative required for this, and make a test exposure on ordinary bromide paper, using, of course, the usual bromide developer and different dishes and measures to those reserved exclusively for the acid solutions of the newer paper. Supposing our average negative required one second at three feet from the gas and the new one required three seconds, we know exactly the exposure for the particular colour required. For it must be remembered that the density of the bromide image depends absolutely on the exposure. With "Ensyna," however, the exposure has no effect on density, and very little on gradation, so that if it matters little what colour we get all preliminary tests may be dispensed with, and the prints exposed straight away. It is impossible for any professional printer to inadvertently under- or over-expose this paper.—"B.J.," Jan. 1, 1909, p. 4.

Developing Formula.—"F. G." has found that a suitable developer may be made by dissolving 2 grs. each of pyro and acetone sulphite in 1 oz. of distilled water. It is rather slower than the

special developer of the makers. If used half strength, a warmer brown tone is obtained.—"Pharm. Journ.," Mar. 6, 1909; "B.J.," Mar. 12, 1909, p. 203.

H. G. Bailey and T. J. Ward state that the metol developer given for the Paget "phosphate" paper (see below) acts satisfactorily with "Ensyna," the only difference being that the time of development is about twice that required when employing "Ensynoid" developer.—"Phot.," Aug. 17, 1909, p. 143.

Remedying Developer Stains on "Ensyna" Paper.—A. D. Weit points out that omission to use fresh developer for each print as directed by the makers may give rise to stains. A solution of potassium bromide and potassium ferricyanide bleached the prints, and on re-development with metol-hydroquinone they were restored to their original chocolate colour, but minus the purple stains. They had lost slightly in depth, so the method would seem to be a safe way to reduce an over-developed print, as well as to get rid of stains.—"Phot.," Feb. 9, 1909, p. 110.

Changing "Ensyna" Prints from Purple to Brown.—F. Airey finds that the purple tone of an "Ensyna" print can be converted into one of a fine brown or sepia very simply. A kettle is arranged so as to send out a good jet of steam, and the finished print, which must be perfectly dry, is held in this jet an inch or two from the spout for about thirty seconds. The print must be kept moving the whole time, and if the kettle is on a fire the print should be protected from the dry heat as much as possible. The process is effective, even after the prints have been mounted. Brown tone prints do not give such satisfactory results when steamed as do those of a purple tone. The process succeeds best with the matt surface paper, the steam leaving it with a satin or carbon surface.—"Phot.," Jan. 19, 1909, p. 56.

Printing Out "Ensyna."—J. Peat Millar finds that "Ensyna" paper printed-out to full vigour under a strong negative gives a satisfactory print. Used in this way the paper gives soft results, and is, therefore, of service in taking a print from a hard negative. Printing requires to be deep, as there is a loss of vigour in the fixing bath, into which the print is placed direct from the frame. The colour of prints so made is a good brown.—"B.J.," July 9, 1909, p. 537.

"Ensynoids" as a Developer of P.O.P.—See under "Developing P.O.P."

PAGET "PHOSPHATE" PAPER.

A new paper placed upon the market by the Paget Co. in July last (1909) is presumably manufactured with an emulsion of silver phosphate. Its rapidity is akin to that of gaslight paper, whilst the

effects produced by development are those of gold-toned P.O.P. The developer is made up from the following stock solution:—

27 1 3		7
Metol		oz. 7 gms.
Acetic acid B.P	3	ozs. 85 gms.
Water to make		20 ozs. 570 c.c.s.
	orgatives 1 oz of this st	

For use with ordinary negatives 1 oz. of this stock solution is diluted with water to 20 ozs. For extra contrast the 1 oz. is diluted only to 10 ozs., or even to 5 ozs.

This is for purplish and sepia tones. For more reddish tones the following is used:—

Metol	 d oz.	7 gms.
Citric acid	 doz.	7 gms.
Water to make	 20 ozs.	570 c.c.s.

One part of this is diluted with nine parts of water.

With short exposure an almost blue-black print is produced, whilst longer exposure gives purplish-brown, reddish-brown, and sepia. The paper is exposed behind a negative either to daylight for a few seconds, to incandescent gas for about a minute, or to one to two inches of magnesium ribbon burned at 12 inches from the printing frame. The developer is poured over the print as it comes from the frame, and the image builds itself up gradually, attaining full vigour in from one to three minutes. The print is given a brief rinse, fixed for half to one minute in a weak acid hypo fixing-bath, and placed to wash for a time, which need not be longer than half an hour, and may possibly be much shorter.

The range of tones is governed by the exposure, and the degree of exposure is seen roughly by the readiness with which the print develops. With the minimum exposure which can be given an almost blue-black print is obtained, closely resembling that obtained with metol-hydroquinone on a gaslight paper. If exposure is cut down below the time necessary for this result the effect is to fog the print in the course of the protracted development necessary to bring out the image. As a further degree of exposure is given, tones are obtained first resembling those obtained on P.O.P. by goldtoning and then of a warmer brown or sepia. It will be noticed that as a fuller exposure is given the contrast of the print obtained is less, but if full vigour is required in a warm-toned print all that is necessary is to use the developer at a lesser degree of dilution. In a word, short exposure with normal weak developer gives cold and purplish tones and full contrast; full exposure and normal weak developer gives soft prints and warm colour, and full exposure with stronger developer gives warm prints of full contrast. It is thus seen that the process allows of the worker readily adjusting his conditions to the character of his negatives. Any prints over-developed readily reduce in a weak Farmer's reducer, whilst any which may be finally obtained of too warm a tone are easily converted to a colder colour by five or ten minutes' immersion in an ordinary combined toning and fixing bath. The prints undergo no alteration as regards colour or depth in fixing. On drying the warm tones cool somewhat, a print which looks yellowish whilst wet drying to a very pleasing brown.

The paper fixes very rapidly in a bath of hypo containing onesixth the weight of hypo of metabisulphite, and need not be washed for a longer time than half-an-hour.—"B.J.," July 30, 1909, p. 599.

Washing Phosphate Prints.—H. G. Bailey and T. J. Ward find that, in the case of both "Ensyna" and Paget papers, it is important that the final washing of the prints should take place in running water, as if left to soak in a dish, even after ten minutes' washing, there is enough "hypo" remaining to destroy the image completely if left soaking for another hour or so. This has been found to be the case both with ordinary "hypo" (15 per cent.) and also with the "Ensyna Acid Hypo."

They also find that washing for 30 mins. even in running water does not completely remove hypo (\frac{1}{4} to \frac{1}{3} gr. remaining in a quarter-plate print). While this may not affect the phosphate prints themselves, the hypo may act on other prints with which they are stored.—"Phot.," Aug. 17, 1909, p. 143.

"Wisto" Paper .- A new paper, invented by Mr. B. J. Edwards, has appeared upon the market under this name. It is of gaslight rapidity, and the faint image produced by a few seconds' exposure to daylight is developed by about two or three minutes' immersion in a solution made by dissolving the special salt supplied by the maker. The image appears first as a pale lavender-grey, which changes to a bright red, further development then causing the tone to change first to a warm, and next to a cold, sepia. A considerable range of colours is thus obtained, there being a certain correct exposure for a print of correct depth and given colour, but if for a certain colour, say cold sepia, the period of development (as a result of insufficient exposure) gives an over-dense print, a weak Farmer's reducer of hypo and ferricyanide will bring back the print to a proper depth without perceptibly altering the colour.—"B. J.," July 23, 1909, p. 578.

Bromide and Gaslight Papers.

BROMIDE PAPERS.

Tentative Development of Bromide Paper .- T. H. Greenall recommends the following method for dealing with bromide exposures which may not be correct. The colour of the print will vary in the case of the longer exposures towards a brown-black, but, as regards gradation, exposures of five and thirty seconds respectively will give prints almost equal.

The solutions used are as follows:-

A.	Pyrocatechin	120 grs.	6.8 gms. 13.7 gms.
	Sulphite of soda Potass. metabisulphite Potass. bromide Potass. carbonate Water.	120 grs. 24 grs. • 20 grs. 300 grs.	13·7 gms. 2·7 gms. 2·3 gms. 34·0 gms. 1000 c.c.s.

This solution may be used repeatedly.

B	Eikonogen			80 grs.	9.1 gms.
20.	C			00 grs.	
	Soda sulphite	e		320 grs.	36.5 gms.
	Water		e.	20 ozs.	1000 ccs

This solution contains no alkali. It will keep, in a full bottle, and may be used repeatedly if the prints are rinsed back and front before immersion. In practice the prints are placed in A solution, the dish covered and rocked occasionally, and the prints kept properly covered with solution. At the end of 6 to 9 minutes, according to temperature, they are examined, and those which show little or no image are taken out, rinsed back and front, and transferred to the B solution, in which they will develop quite satisfactorily unless, of course, the exposure has been hopelessly short. They are then put to fix, and the prints remaining in the A solution are again examined. Some of these will appear nearly finished, excepting that detail is lacking in the high-lights. These are taken out, rinsed, and given a shorter time in the B solution, which will bring out the detail in the high-lights if it is at all printable, whilst others of the prints, and these are the maximum exposures, will require none of the B solution, which, indeed, would veil them, but will yield good prints in the A solution alone, in a total of 12 to 20 minutes, according to temperature and other conditions, and provided the exposure has not been greater than 6 times the minimum.

Plenty of yellow light is needed: use yellow tissue paper behind which is an incandescent gas jet. This will fog some of the very rapid bromide papers unless used with caution. In dealing with varied negatives give a flat one a short or medium exposure and long development in the A solution, whilst give a contrasty negative a full exposure, followed by short development in A solution and relatively more in the B. Bear in mind that other bromide papers may require some modification in the A solution, or in the time of development, and that the very rapid ones will be likely to show least latitude and most liability to fog. The carbonate of potash recommended is of "B.P." quality, which is good and cheap. It does not keep well in powder, but makes a permanent 50 per cent. solution. An acid fixing bath must be used. Finally, the prints may be sulphide-toned if desired .- "Photo Notes," Apr., 1909, p. 64; "B.J.," Apr. 16, 1909, p. 307.

Acid Diamidophenol Developer.—M. G. Underberg strongly recommends this developer for both gaslight and bromide papers on account of its non-fogging qualities and of the absence of greenish shadows, and freedom from stains. Moreover, a single formula may be used for all brands of paper :-

8 2	Solution S*	d oz.	15 c.c.s.
1.81	Diamidophenol	8 grs.	0.5 gm.
	Solution BB*	85 to 135	
			5 to 8 c.c.s.
	Water to make	3½ ozs.	100 c.c.s.

A greater or less quantity of the bisulphite solution is used according to the slowness with which the developer is desired to work. With 8 c.c.s. (135 mins.) a fairly restrained developer is obtained, and this quantity should be employed in summer. In winter, when the lower temperature itself restrains the bath, 6 to

7 c.c.s. are used (100 to 120 mins.).

The paper is immersed in the developer and the film side gone over with a piece of soft cotton-wool, which removes air-bells. There is no need to place the paper first in water. The acid bath, by its steady action, does not give rise to stains, and very rarely to white spots due to minute air-bells. If the image happens to come up too slowly it is well to turn it over face down, by which action the development appears to take place more quickly. The formula given above may be further diluted up to 300 c.c.s. (10½ ozs.), such a dilution being particularly advisable in the case of enlargements where softness is desired, or where it is found necessary to resort to local development. For this latter a camel's-hair brush is dipped in solution BB more or less diluted. A thin image having been developed, the solution is poured off from the paper, and those parts which are to be held back gone over with the brush, after which the developer is re-applied. By repeating this operation several times the desired degree of restraint may be obtained without any fear of yellowness of the high-lights or of unequal action. After development the print is rinsed, fixed for at least fifteen minutes, washed, and put to dry.-" Photo-Revue," July 25, 1909, p. 25; "B.J.," July 30, 1909, p. 591.

Reducing Bromide Prints.—C. Harold Smith recommends the use of the Farmer reducer in two stages, a weak bleaching bath being first given to the print (for a time found by previous trial on a waste print in the case of slight reduction), after which the print is rinsed, placed in a bath of plain hypo (2 ozs. per pint) for ten minutes, and afterwards again washed. The bleaching bath is:—

Potassium ferricyanide (5 per cent. solu-

action in a certain time cannot be depended upon.

The advantage of the method lies in the fact that the shadows of the print are reduced to a greater extent than the high-lights, the more delicate tones thus being preserved. The colour of the print, too, remains unchanged.—"Phot.," Oct. 6, 1908, p. 449.

Prints in Greasy Ink from Bromides.—See "Miscellaneous Printing Processes."

GASLIGHT PAPERS.

Prints in Numbers of Regular Black Tone.—Dr. G. Hauberrisser, as the result of experiments made to find a means of preventing a gaslight developer from giving prints of imperfect colour after

use for one or two sheets of paper, has found that the addition of a few drops of tribasic sodium phosphate solution is an effective aid. Using edinot single solution developer and "Tula" or other gaslight paper, a few drops of 10 per cent. tribasic sodium phosphate solution after each print had been developed was found to keep the developer in proper condition to give a good black tone, the time of development remaining practically the same. The time which a print takes to come up may be taken as an indication whether the developer does or does not require a little of the phosphate solution.—Eder's "Jahrbuch," 1908; "B.J.," Nov. 20, 1908, p. 887.

Control in Developing Gaslight Prints.—T. H. Greenall secures considerable latitude in exposure by adopting a tentative method of development, placing the prints first in a highly restrained developer of hydroquinone and pyrocatechin, and after a short immersion transferring to a solution of eikonogen and sulphite without alkali. It was found that by this method four prints from the same negative made on "Rotox" paper with exposures 20, 40, 60, and 90 seconds were practically alike as regards gradation and density, and very little different in colour.

As the prints are exposed they are placed in the following solu-

tion at normal temperature (60 degs. to 65 degs. F.) :-

Pyrocatechin	2 grs.	0·13 gm.
Hydroguinone	2 grs.	0·13 gm.
Sulphite of soda	20 grs.	1.3 gm.
Citric acid	2 grs.	0.13 gm.
Potass. br mide	1 gr.	0.065 gm.
Potass. carbonate	20 grs.	1.3 gm.
Water	6 ozs.	170 c.c.s.

It is well to dilute this further and place the prints upright in the diluted developer in a tank. After 2 or 3 minutes in the concentrated, or 10 or 15 minutes in the tank, developer, examine the prints as regards their lighter tones. A print which already looks pinky all over must be left to finish out in the restrained developer, as it has had long exposure, and will give a warm-coloured print of good gradation if left until it appears very strong and rich before fixing. But the majority of the prints should show either nothing at all, or a pinky deposit in the shadows only, after the above time in the restrained developer, and these are to be taken out singly as the shadow detail appears, rinsed under the tap back and front for a few seconds, and finished in the eikonogen solution. This contains no alkali, and it will bring up the high-lights even when the exposure has been one-fifth or one-tenth of the three minutes required for a sepia print; at the same time, it will not block up the shadows :--

Eikonogen	100 grs.	11.4 gms.
Sulphite of soda	600 grs.	68.4 gms.
Water	20 ozs.	1000 c.c.s.

This solution may be used repeatedly, provided the prints are always rinsed as they are transferred to it. As to the proper

moment to make the transfer, the general rule is to leave the prints to gain some shadow detail in the restrained developer, and use the eikonogen for finishing off, but a print from a contrasty negative should be changed earlier than one from a flat negative, which should be left a longer time in the restrained developer to gain increased contrast.

The eikenogen alone would give an extremely soft and thin result, whilst the restrained developer alone would give either nothing, or "soot and whitewash," except in the case of those long exposures already referred to. Fixing is in the usual acid fixing bath, and it is well to bear in mind that blacks and cool sepias do not lose as much in fixing as do the warm sepias before mentioned.

Finally, should it be desired to have "red chalk" prints, it is only necessary to give long exposure and use the restrained developer with a little extra bromide.—"Photo-Notes," Feb., 1909, p. 30; "B.J.," Feb. 19, 1909, p. 139.

P.O.P. Tones on Gaslight.—Harold Baker mentions that a gaslight print if left in the acid fixing bath for from twelve to fourteen hours will assume a tone resembling that of a gold-toned P.O.P.—
"Phot. Scraps," Oct., 1909; "B.J.," Oct. 8, 1909, p. 785.

Toning Bromide and Gaslight Prints.

SULPHIDE TONING.

Dry Sulphide Toning.—It is suggested that the use of bromine vapour might be used as a method of toning dry prints, its bleaching action being followed by the application of sulphuretted hydrogen gas. This pair of substances in solution provides an excellent toning process, no washing between bleaching and darkening being necessary. The process, either wet or dry, might be made workable in conjunction with a rotary developing and fixing plant.—"B.J.," Feb. 5, 1909, p. 98.

Scum on Sulphide-toned Prints.—In some notes on the theory of sulphide toning it is mentioned that the sheen or scum on a sulphide-toned print can be partially removed from the dry print with hard indiarubber, or from the wet print by rubbing with cotton wool after the bleaching bath has been applied. A remedy, therefore, is to re-bleach the print, rub with cotton wool and to re-develop.—"B.J.," Jan. 29, 1909, p. 79.

The Developer and Sulphide Tones.—Harold Baker advises the use of more hydroquinone than metol in the developer of this formula when warm sepia colours are required from an average negative, using also a liberal quantity of bromide, and rather less sodium carbonate solution than usual. If cool sepias are wanted, equal parts of metol and hydroquinone are taken, and potassium carbonate used as the alkali, the exposure being about half the time for warm sepia.—"Phot. Scraps," Oct., 1909; "B.J.," Oct. 8, 1909, p. 784.

Factors in Sulphide Toning.—Douglas Carnegie, in the course of an important paper on the practice of sulphide toning, arrives at the following results:—

Colourless commercial crystals of soda sulphide were found to contain 97.6 of the real sulphide cryst (Na₂S 9H₂O). In practice a solution should be used not much weaker than 1% of real (anhydrous) sulphide, i.e., one made as follows:—

Soda sulphide,	commercial white cryst.	300 grs.	33 gms.
Water		20 ozs.	1000 c.c.s.

Though the decomposition of solutions of this strength is very slow when they are kept well corked and in darkness, yet if absolute constancy of tone is essential it is necessary to use freshly made solution. The bleaching solution should not contain an excessive quantity of bromide, otherwise the bleached image is liable to be dissolved and to lose fine details. A suitable formula is:—

Potass. ferricyanide	300 grs.	34.8 gms.
Ammonium bromide	95 grs.	10.8 gms.
Water	20 ozs.	1000 c.c.s.

This may be used over and over again to complete exhaustion, so long as it is kept in a stoppered bottle in the dark.

No evidence could be discovered in support of the statement sometimes made that the bleaching solution after frequent use is found to contain potass. cyanide.

When sulphide solution much weaker than the true 1% is used, the wash after bleaching should be of short duration. Long washing, especially when using weak sulphide solution, leads to poor tones. Good warm tones are obtained simply by rinsing the print after bleaching and then passing on to the sulphide bath, but when this is done the sulphide bath must be thrown away at once. Generally the evil effect of long washing is most marked in the case of solutions of 4% strength (real sulphide), but in no case is a short wash injurious.

As sulphide deteriorates in solution (hypo being formed), the tones of prints pass through successive phases of degradation as follows:—

(1) The bistre phase—the toned image becoming progressively colder and rawer.

(2) The ochreous phase—the image getting progressively lighter

and often showing metallic glance in the shadows.

(3) The phase of incipient solution of the bleached image with re-precipitation in the sulphuretting solution, a faint yellow image remaining in the gelatine.

(4) The phase of complete solution of the bleached image, leaving

only the residual image of development in the gelatine.

The change in the sulphide solution which produces these results is due more to the action of air than to that of light upon the sul-

phide bath. It is much more rapid with solution of 1% than with

chose of 1% of real sulphide.

It was found that the alteration in the solution giving the excessive tones 1 to 4 is dependent on the proportion of sulphide to hypo in the sulphide bath, and that this ratio varies for every different strength of sulphide bath. Thus, the ratio hypo: sulphide which must be reached to bring on phase (1) is about 8:5 for 1.5% sulphide, but only 2:5 for 1% sulphide. Again, the ratio for phase (3) was 8:1 in the case of a 1% sulphide solution, and only 4:1 for a solution of .05% concentration.

The polysulphides of sodium (made by boiling sodium sulphide solution with sulphur) give colder tones than the mono-sulphide, and the solutions deteriorate very rapidly. Yellow "sulphide of ammonium," so-called, also gives colder tones than sulphide of sodium.

There seems to be no satisfactory method of bettering a sulphide toning failure by any process of re-bleaching and re-sulphuretting. The only procedure with a failure is ruthlessly to scrap it, and begin

de novo using a freshly made sulphide solution.

For bringing out blocked up detail in the heavy shadows of toned prints there is no better specific than "Lustralene." It as advisable to heat the print before a gas fire after waxing it.—" B.J.," Aug. 27, 1909, p. 664.

Ferricyanide and Mercury in Sulphide Toning.—H. W. Bennett, in a paper before the Royal Photographic Society, has given the formulæ used by him in obtaining a range of tones from warmblack to brown by employing as a bleaching solution a mixture compounded from two stock solutions, one containing (in every 10 minims) 1 gr. of potass ferricyanide and 1½ grs. of potass bromide; the other containing (in every 40 minims) 1 gr. of mercuric chloride and 1 gr. of potass bromide. These are employed in various proportions much on the lines laid down in the table by the same worker in "B.J.A.," 1909, p. 604. The working solution should contain 4 grs. of ferricyanide per oz., and there might be the same quantity of mercury chloride.—"Phot. Journ.," June, 1909, p. 280.

Improving Sulphide-toned Enlargements.—W. J. Routley, for the improvement of large sulphide-toned prints of weak or yellowish colour and large enough to make the trouble worth while, suggests the following process by which the sepia is intensified or the original black or grey brought back. Four solutions are required:—A, the ordinary mercury solution used in intensification; B, redeveloper made by diluting any bromide paper developer with from four to ten times its bulk of water; C, the ordinary bleacher of ferricyanide and bromide; and D, the ordinary sulphide solution.

The A solution acts in from 30 seconds to a minute on the print, partially bleaching it. The print is then given a wash of at least ten minutes, and, for a black tone, re-developed in B of the weakest strength—i.e., diluted ten times. If developed until just a trace of warmth is left a fine black print, without warmth, will be ob-

tained on drying.

If a second sulphide-toning is to be done, use B four times diluted only and re-develop fully. Print will be seen to be considerably intensified, and is then put through the ordinary sulphide toning process. If necessary the print can be again bleached in the mercury and once more re-developed and toned. The results have shown no signs of change within the three months elapsed since producing them.-" Phot.," Dec. 29, 1900, p. 689.

Re-toning Sulphide-Toned Bromides .- It is well to use a strong bleacher (potass bichromate, 10 grs.; hydrochloric acid, 20 minims; water, 1 oz.) when rebleaching prints which have failed to darken or to give a good tone in the sulphide bath. And it is well to allow bleacher to act for from fifteen to thirty minutes to make sure of complete action. A 1:5 rodinal developer applied to the washed print will usually give a strong image; if not, a short exposure of the print to strong light should be tried, and if this fails to yield sufficient density in five minutes let the print soak in the developer for another ten minutes, then wash and transfer it to an ordinary strong bromide paper developer, such as amidol or metol-hydroquinone. If none of the image has been destroyed by the hypo in the sulphide solution, we shall, by these means, produce a good strong result, which may be black if the re-development has been rapid, or a fine rich brown if the development was slow. If desired, we can then re-tone, using quite fresh solutions; but, as a rule, the brown tone arrived at in the process of re-development is a far finer colour than any possible by sulphiding methods, and it may be well left alone.—"Photo-Notes," Mar., 1909, p. 45; "B.J.," Mar. 12, 1909, p. 198.

THIOMOLYBDATE TONING.

Thiomolybdate Toning.—The patent specification of Harry E. Smith gives the directions, which appeared in the "Almanac" for 1909, p. 606. Eng. Pat No. 22,218, 1907.—"B.J.," Nov. 6, 1908, p. 853.

For thiomolybdate toning of print-out papers, see under "Toning

P.O.P.'

OTHER TONING METHODS.

Sepia Tones by Re-development.-C. Welborne Piper has worked out a method of obtaining warm tones by bleaching the print and redeveloping in full light with a highly restrained developer as used in the ordinary way for obtaining warm tones usually on lantern slides. The advantage of this process over that in which a restrained developer is used in the first instance is the greater certainty of working and the much better regularity of tone which can be secured in a series of prints. The tones are better than those by the sulphide A suitable bleaching solution consists of 10 grs. of bichromate of potash and 5 minims of hydrochloric acid per ounce of water. The bleached prints are well washed and immersed in the following developer, which is used in a good light (daylight):-

A,—Hydroquinone Potass. metabisulphite	160 grs. 90 grs.	36.5 gms. 20.5 gms.
Potass. bromide	20 grs. 10 ozs.	4.6 gms. 1000 c.c.s.
B.—Ammonium carbonate		100 gms. 1000 c.c.s.

A mixture of equal parts of these two solutions forms a very useful

developer.

With two parts A, one part B, and one part water development is slower, and we can stop at a light red-brown tone. With two parts A and three parts B development is quicker, and a deep brown

is quickly reached.

Very good warm browns are produced when potass, ferricyanide is the bleacher, while with the ferricyanide and bromide bleacher purplish browns are more readily obtained. When copper chloride is the bleacher black tones only are produced.—"B.J.," Mar. 26,

1909, p. 231.

Some further notes on the method recommending an ordinary hydroquinone developer modified by using for the alkali or No. 2 solution a mixture of ammonium bromide 1 oz., strong ammonia 1 oz., in water 10 ozs., are given by Mr. Piper. Equal parts of the two solutions are mixed and the mixture diluted with an equal bulk of water. This re-developer gives a rich brown tone.—"Photo-Notes," Apr., 1909, p. 67.

Red, Green, and Blue Tones.—C. W. Somerville recommends for a red tone the use of an alkaline solution of copper ferricyanide in preference to the Ferguson formula in which potassium citrate is used as a means of preparing a clear workable solution of copper ferricyanide. A suitable formula is:—

Ammonium carbonate (saturated solu-		
tion)	1 oz.	30 c.c.s.
Copper sulphate		0.65 gm.
Potassium ferricyanide	25 grs.	1.6 gm.

Owing to the alkaline condition of the ferricyanide this formula works more rapidly. (For the sake of historical accuracy it should be mentioned that an alkaline solution of copper ferricyanide made by dissolving first copper sulphate and then potassium ferricyanide in saturated solution of ammonium carbonate preceded the Ferguson method. The first working directions are probably those in the "Photogram," 1896, p. 90.—Ed. "B.J.A.")

For green tones a solution of vanadium chloride and potassium ferricyanide containing also a ferric salt is the most satisfactory

process. The formula is :--

Ferric chloride	1 gr.	0.065 gm.
Oxalic acid (saturated solution)	60 ms.	31 c.c.s.
Vanadium chloride (pure)	2 grs.	0.13 gm.
Nitric acid	5 ms.	0.3 c.c.
Water to make	½ oz.	14 c.c.s.

Then add, stirring the while-

Potassium ferricyanide 1 gr. 0 065 gm, Water to make 1 oz. 14 c.c.s.

Tone from one to two minutes; the longer the immersion the lighter the green. Wash ten minutes and immerse in hypo bath given for blue tones. Wash five minutes.

For blue tones the mixture of ferricyanide and a ferric salt should contain also potassium oxalate, which tends to prevent

precipitation. The formula is :-

Ammonia alum (10 per cent. solution)	50 ms.	2.8 c.c.s.
Potass. ferricyanide (10 per cent. solu-		
	10 ms.	0.6 c.c.s.
Potass. oxalate	30 grs.	1.9 gm.
Ammonia iron alum		0.8 gm.
Hydrochloric acid	21 grs.	0.16 gm.
Water		28 c.c.s.

The toning action is continued until the desired shade is obtained and the print then washed free from stain. It is then placed in a hypo. bath of—

hypo. bath of—		
Нуро	4 ozs.	250 gms.
Boric acid	400 grs.	45 gms.
Water	20 ozs.	1000 c.c.s.
and finally washed for five minutes" A.P.	." Feb. 2.	1909, p. 101.

Two-Colour Effects with Bromide Paper .- Dr. D'Arcy Power, in discussing methods by which to obtain with bromide paper twocolour effects such as those produced by multiple-gum or gum and platinum, gives the preference to the two following methods:-(1) Toning the whole print to sepia with mercury and platinumchloride, and then producing local toning (to a rich black) with amidol developer applied with a brush; (2) local bleaching as for the sulphide process, washing, and conversion of the partially bleached print into an ozobrome by the non-transfer or No. 1 method. Owing to the absence of metallic silver in unbleached portions no pigmented gelatine is thrown down at these points. The ozobrome is washed and dried, and the bleached area re-developed with a brush charged with amidol developer, again washed and brought into contact with a piece of ozobrome tissue of the desired second tint. Development is carried out as before, a second deposit of pigmented gelatine occurring solely over the re-developed area, and thus giving a print in any two of the colours in which the ozobrome tissues are obtainable.-" Photo-Era," May, 1909, p. 221.

The Carbon Process.

Charbon-Velours.—H. Schneeberger gives directions for the making of a paper which he called "charbon-velours" of properties evidently similar to the "Artigue" paper much used in the pre-gumera of English pictorial photography. A stiff paste of starch is rubbed up with the necessary quantity of pignient. This latter may

be the various powder water-colours or the moist colours, so long as these latter contain no tanning substances, for which reason it is better to keep to the powder colours. Compared with other pigment papers, a very large proportion of pigment is used, the mixture being applied in a thin coating, but yet representing an application of pigment which completely covers the white paper. If applied too thickly the result is that of canbon worked without transfer; that is to say, the half-tones and those parts where the light has not penetrated to the support wash away. With too thin a coating the characteristic velvety appearance is not obtained. The coated paper may be stored for any length of time. It is sensitised in the ordinary hichromate bath of from 2 to 5 per cent. strength, the weaker for flat and the stronger for hard negatives. Development is done with a broth of sawdust, about 120 gms. per litre of water, which is poured over and over the print at about 80° F.—"Phot. Kunst," Nov. (Heft II.), 1908, p. 285.

Direct Carbon Copies from Drawings.-See "Contact Copies of Plans, etc.," under "Copying."

The Ozobrome Process.

Border Prints with Ozobrome.—The Rev. T. A. Cooper uses ozobrome in conjunction with print-out paper as a means of producing an artistic two-colour border effect for prints or postcards. One or more borders are printed round a white space (obtained by a mask) on ordinary or self-toning P.O.P. of matt or rough surface. A good bromide or gaslight print is then made from the negative to be inserted in the space, and trimmed exactly to size. A piece of ozobrome plaster is then cut 1/8-in. larger than the picture, and the bordered postcard, previously soaked in warm water, is used as the final support of the ozobrome picture made in the ordinary way. Care should be taken to mark on the back of the plaster which is the top of the picture, and that the plaster exactly fits in its place; this is easy, because the size of the picture shows through the back of the plaster as well as plaster itself, exactly fitting the first printed border. Should the margin of the tissue be noticeable on the dark line of the border or have spread beyond by any carelessness, it may easily be removed with a sharp knife before the carbon is dry. The result is a superior-looking pictorial postcard which has the appearance of being printed in two colours, if the tints of the silver printed border and the colour of the carbon are well chosen.-"Phot. Monthly," Jan., 1909, p. 12.

Ozobromes in Colour.—W. Ermen describes the procedure used in obtaining multi-colour effects by the ozobrome method:—Let us suppose that we have an open landscape, in which there is a blue sky with white clouds, green hills, water, ships and beach. Make a good bromide print of this, and after washing thoroughly, rinse in dilute formaldehyde, and allow to dry. The sand, and any other portion of the picture which is wanted yellow, is carefully washed over with a brush just moistened in ozobrome stock solution until

bleached, and the print then flooded with water, so that the excess of solution is washed off without damaging the rest of the print. The whole print is next treated with marine blue ozobrome tissue, which gives us the landscape all in blue, except the sand, which is left bare of pigment. The print must now be dried again, to enable the newly deposited gelatine to stand the next processes. When quite dry, take a fine camel-hair pencil just moistened with a strong developer, and go over all the portions of the print that are required black, such as the hulls of ships or rocks. With a weaker developer clouds may also have their shadows slightly emphasised.

For the production of greens we proceed in the same manner, only using sodium sulphide solution of the ordinary toning strength. The yellowish tone of this combines with the blue pigment deposited to give just the dull green required for grass. The tone of green can be modified at will by varying the amount of sulphide applied, and can be shaded off to the blue of the distance without any

difficulty.

Finally, the yellow sand is got by painting the portions of the

print which were bleached before pigmenting.

The finished print is finally fixed in hypo after a slight washing

to remove the last traces of developer and sulphide.

The introduction of other colours into the print offers no difficulty. Suppose that in the print which we have already discussed, we wish to bring out a red sandstone wall running over the hill. Those portions of the print reserved for red are protected by a preliminary bleaching. The print is then manipulated as before, but instead of fixing after sulphiding, the reserved portion is redeveloped instead of the rocks and the ships. The print is then washed and rinsed in formaldehyde, and dried to harden the pigment layer. The ozobrome manipulation inserts red pigment on all the developed portions. A slight reddish tint may show on other light portions of the paper, but this can be scrubbed off without fear of disturbing the underlying blue pigment, which not even boiling water will remove. Further layers of colour can be put on to any part of the unsulphided portions by redeveloping as before, after drying with formaldehyde. The last stage is always the blackening with developer where required, followed by fixing.

One word of warning. If the sky is reserved by bleaching, with the object of putting on the blue layer last of all, the pigment tissue must not be allowed to remain too long in contact with the print, or else the sky will come out much too dark. Probably this is due to the insolubilising action of developer left in the paper, which is subsequently oxidised by the ozobrome solution.—"A. P.,"

June 15, 1909, p. 571.

Casein-Pigment Prints from Bromide or other Silver Prints.— The Neue Photographische Gesellschaft has patented the method of preparing pigment prints from those on silver bromide, or other silver paper, by brushing over the finished silver print a mixture of casein and pigment. The coating is allowed to dry, and the coated print then placed in a solution containing potass ferricyanide, potass bichromate, and potass bromide. In this solution an image in insoluble casein containing pigment is formed, just as one of gelatine is produced in the ozobrome process by application of a pigment

tissue, soaked in a similar solution, to a bromide print.

The case in may be employed either in the so-called "curd" or in acid or alkaline solution. One formula is as follows:—250 gms. of pressed-out curds are ground with 50 to 60 gms. of water-colour. This mixture is brushed over the bromide print, allowed to dry, and print then placed for 10 to 15 minutes in—

Potass.	b'chromate	10 gms.	88 grs.
Potass.	ferricyanide	10 gms.	88 grs.
Potass.	bromide	10 gms.	
Water		1000 c.c.s.	20 ozs.

The picture is then "developed" in water at from 105° to 125° F., to which a little potass oxalate or sodium bicarbonate may

be added to secure clearer lights.

A variation of the process is to first bleach the bromide or other silver print in 5 to 10 per cent. potass ferricyanide, to then apply the mixture of pigment and casein, to dry, and then to immerse in a solution of bichromate and bromide, afterwards developing in warm water and fixing in hypo.—Eng. Pat. No. 19,297, 1908; "B.J.," June 18, 1909, p. 480.

Ozobrome for Enlarged Negatives.—See under "Reproducing Negatives."

Gum-Bichromate.

Arabin Process.-Nelson K. Cherrill has devised a modification of the gum process, using in place of gum the arabin or gummic acid obtained by precipitation from gum solutions with acid and spirit. He also employs pigment perfectly freed from grease, the need for this freedom and the use of the gummic acid being based on the theory that in the development of the gum print the parts rendered insoluble by light form a membrane through which the unaffected parts pass. To prepare the arabin, 150 c.c.s. of 5 per cent. hydrochloric acid are placed in a litre jar and 100 gms. finely powdered and sieved Soudanese gum (14d. lb.) poured in with vigorous stirring. Mixture may be warmed to 122 degrees F., but must not be made hot. Solution is complete in half-an-hour with frequent stirring, and mixture is then left to cool. 600 c.c.s. of best methylated spirit, free from mineral naphtha, is now added, and mixture well stirred at intervals for half-an-hour; the gummic acid (arabin) is precipitated as a white mass, which, as the water is removed from it by the spirit, ceases to have any stickiness. The whole contents of the jar are then poured out on to a muslin or cheese cloth, laid on top of a funnel so as to drain and squeeze off all possible liquid. The arabin is now placed in a second jar and covered with spirit to a depth of an inch or so, breaking the mass up well with a stick of wood. It is then left to itself for several hours, and the liquid again drained and squeezed off in clean cheese cloth. The arabin should now have a gritty feeling.

final traces of liquid are removed in a screw-press, the arabin being wrapped in a towel. It is then put to dry at a gentle heat and broken up in a mortar. A neutral solution of the arabin is made as follows :-

		20 gms.	
-	Magnesium carbonate, heavy	2 gms.	
SEAD	Water	40-75 c.c.s.	(See later).

This will be very frothy for several hours; stir until froth subsides, and filter through a muslin bag. The filtrate is the liquid to be mixed with the pigment and bichromate in making the

sensitising liquid.

To prepare a pigment black perfectly free from grease the best plan is to burn camphor in a closed vessel, to collect the "soot" produced, and to wash it five or six times with a mixture of ether and acetone in a test tube, it being finally dried by dipping the lower end of the test tube in hot water. A suitable black, corresponding to the above, is made by Newman and Co., 24, Soho Square, W.C., as "Lamp-black No. 4."

In deciding on the proportion of pigment to gum solution, regard must be paid to the fact that a certain quantity of gum is needed to allow of the pigment being completely removed from the paper in a short time, or, say, in the time which the print itself takes to develop. Adopting thirty-five minutes at 95 degrees F. as a normal time for development, the most satisfactory method of coating papers (which vary in their powers of fixing the pigment) is by using arabin solutions containing 20 parts in 45 to 75 parts respectively of water. Lamp-black is added to each of these in the proportion of 0.4 to 0.5 gm. per 10 c.c.s., and the two mixtures mixed in various proportions to give a perfect result. Just before use the mixture is sensitized by addition of an equal volume of 15 per cent. ammonium bichromate (dissolved hot), neutralised by addition of precipitated chalk.

The paper is thinly coated, and is printed and developed in the usual way. It gives "straight" prints of full gradation, whilst it allows of any degree of control.—"Phot. Monthly," June, 1909,

p. 129.

Preparing Gum Paper.—T. C. Hardy recommends that raw paper, as used by makers of bromide papers, should be used, a brand being selected by examination with a lens, and that having the most irregular surface selected. The paper is sized with a mixture of alum and gelatine, made as follows :-

Water		200 c.c.s.
Gelatine	doz.	10 gms.
Potash alum	10 grs.	0.45 gm.

The gelatine should be dissolved in nine-tenths of the water. the alum in the remainder, and the latter added slowly to the gelatine solution with constant stirring.

Two applications of this are given, the paper being allowed to dry after each. It is then a good plan to immerse the paper in a 2 per cent. solution of commercial formaline (again drying) before applying the sensitiser, which is a 15 per cent. solution of ammonium bichromate, and is applied with a brush previously wetted. This pigment mixture consists of one part of gum arabic dissolved in the cold in two parts of distilled water and containing water-colour to give the intensity desired.—"A.P.," May 4, 1909, p. 420.

Powder Sensitisers in Gum Printing.—Société Anonyme la Photographie des Couleurs, J. Sury and E. Bastyns, have patented a dry mixture such as one of gum arabic, 20 parts; sugar, 1 part; potass, bichromate, 4 parts; together with pigment, 20 parts, for use as a sensitising mixture for the gum-bichromate printing process. A mixture, such as the above, is dissolved in twice its weight of water to form a sensitising liquid, which is applied to paper, and the latter exposed under the negative and developed in water just as in the gum process. The mixture is intended to be used in making three-colour prints by successive sensitising of the same piece of paper.—Eng. Pat. No. 27,686, 1908; "B.J.," Aug. 20, 1909, p. 654.

Gum-Platinum Printing.—Malcolm Arbuthnot, in reviving the use of the gum process applied to a paper on which a platinum image has already been made, does so on the ground of thus securing the fine rendering of half-tones of the platinotype process and the shadow-depth of gum. Registration being necessary, it is convenient to use a drawing board instead of a printing frame, as suggested by the late Horsley Hinton, attaching a piece of stout flannel to the board, laying upon this the platinum paper, coated side up and half an inch larger than the negative, the paper being pinned to the board at the four corners. Stout pins are then driven through the paper into the board so that they press firmly against the sides of the negative laid centrally upon the printing paper. The platinum print having thus been made—the negative is lifted off to watch the progress of printing—it is coated with the gum sensitiser and placed again on the flannel-covered board, passing the pins into the same holes in paper and board. The coating with the gum mixture, printing and development are done in the ordinary way. If it is found that the gum print has been overexposed, it is soaked for two or three hours in 5 per cent. alum solution.—"A.P.," Mar. 2, 1909, p. 197.

The Oil Process.

Oil and Bromoil at One Operation.—Ernest Marriage describes the method of obtaining from one bromide print a (reversed) oil print for pigmenting, and also a bromoil to be treated in the same way. The bromide print is best of smooth but not glossy surface, such as the "Rotograph" half-matt. The transfer paper is best that of the smooth variety used as the final support in the double transfer carbon process. The transfer paper is soaked in ozobrome

solution, mixed with four times its volume of water, the bromide print meanwhile soaking in plain water. As soon as the transfer paper is limp it is placed for ten seconds in the following solution:—

Hydrochloric acid	1 drachm	3.5 c.c.s.
Common salt		
Water	25 ozs.	700 c.c.s.

It is drained for half a minute from one corner, placed in contact with the bromide print under water, and the two then squeegeed together as in the ozobrome process. It is important that the transfer paper be larger than the bromide print. The transfer paper and the print now in contact should be left to dry a little (say, two or three minutes), the print uppermost. All that is wanted is to ensure that the margin of the transfer paper which is uncovered is dry enough to resist the solution in the next operation. The transfer paper does not soak up as much of the ozobrome solution as carbon tissue will, not enough, in fact, to bleach the silver image; and in order to get the maximum hardening effect the silver must be entirely converted. The transfer paper, still squeegeed to the print and the print uppermost, is now floated upon the ozobrome solution. In this way all the active solution must go through the transfer paper to reach the silver image, and is more likely to take effect than if part of the bleaching is done through the back of the bromide print. The time required is about fifty minutes, but this would vary, no doubt, with temperature and different types of paper. It is easy to see when the bleaching process has been thoroughly carried out by holding the papers against a strong light; a faint image will be still visible, but all black should have disappeared. If this is not the case, the prints should be again floated on the ozobrome solution. The print should be held by opposite corners and lowered gradually on to the surface of the liquid, beginning at the middle; in this way the paper can be floated without getting any of the solution on to the bromide print lying uppermost.

When the bleaching of the silver image has been thoroughly effected, the print is separated from the transfer paper by pulling from one corner, and both print and transfer are placed for about a minute in the acid bath. After washing until both papers are free from stain, the transfer paper is dried. The bromide print is fixed in a bath of plain hypo, if it is to be treated as a bromoil, and dried after washing; or it may be redeveloped, dried, and used again for making further transfers. The dried prints, whether bleached bromides or transfers, are soaked for an hour in water at about 65 deg., then blotted off and inked up on a wet pad in the usual way. A stiff lithographic ink, thinned down with pale drying oil is used. The transfer print or ozo-oil may require just a touch more oil with the pigment than the bromoil.—" Photo-Notes," July, 1909, p. 125.

Oil-Ozobrome.—The method of preparing an oil print by a transfer process from a bromide is the subject of a booklet issued by Messrs. Ozobrome, Limited, who supply the necessary transfer paper. This latter is placed in the bleaching bath given under "Bromoil," laid

on a glass slab, and the bromide print (soaked in salt solution) squeegeed in contact with it. The salt solution is:—

Common salt	. 1 oz.	50 gms.
Water	. 20 ozs.	1000 c.c.s.

Transfer paper and bromide print are kept in contact for from 5 to 15 minutes. The progress of bleaching can be seen by holding the two papers up before a fairly strong light. When it is seen that the image is completely bleached the two papers are separated under water, washed for a few minutes, and the transfer paper then prepared for inking by allowing it to become perfectly dry and then re-soaking in water for 5 or 10 minutes.—"B.J.," Sept. 10, 1909, p. 707.

Finishing-off Oil Prints.-Professor A. Albert recommends that the wet prints should be laid face up on a glass plate and secured to the latter by four strips of gummed paper, being then put aside to dry spontaneously, which they do within twelve or twenty-four hours. The surface is then freely dusted over with French chalk (talc), the excess removed with a soft brush or tuft of cotton-wool, and the print then flowed over or painted with a solution of shellac in alcohol until there is no further repulsion of the shellac by the strong portions of the print. The veiling of the pigment by the French chalk is removed by this varnishing, and the varnish dries very quickly, the film being so thin that there is scarcely any effect upon the matt surface of the print. When the shellac coating is dry the surface may be given a thin coat of a very fine grain matt varnish. When this is dry, the print is removed from the glass and mounted. In this latter operation the print is first laid for about twenty minutes between wetted sheets of paper (filter paper), a good paste then applied to the back, and the print pressed into adhesion. -" Phot. Korr.," Feb., 1909, p. 86.

The Bromoil Process.

(Oil Prints from Bromides.)

A formula for the bleaching of the bromide print to be converted into a bromoil is given as follows by A. H. Garner:—

Potass ferricyanide	2 grs.	2.3 gms.
Potass bromide	9 grs.	10.3 gms.
Potass bichromate		10.3 gms.
Ammonia alum		20.5 gms.
Hydrochloric acid (10 per cent. solution).	20 drops	30 c.c.s.
Water	2 028.	1000 c.c.s.

This is used at a temperature of 80° F. (not lower) from two to four minutes. If the alum and hydrochloric acid be omitted the resulting image will take the ink but very sparingly. If alum be now added bleaching in the deepest shadows goes on very slowly, while the capacity of the image for taking ink is greatly increased. Addition of a little 10 per cent. hydrochloric acid solution quickens

bleaching and raises the key of the whole print—that is, keeps the whites pure and tends to prevent reversal. Five drops of the acid solution per ounce is sufficient for a soft gelatine paper, or 20 drops per ounce for the hardest. Addition of acid thus will correct a paper which takes ink too readily, and, further, a soft, delicate print is best bleached with a minimum of acid; a strong overdone one, with a maximum.

At a lower temperature than 80°, say 60° to 65° F., the bleaching action takes place, but the bromoiling effect is greatly inferior.—

"Phot.," Jan. 12, 1909, p. 34.

Messrs. Ozobrome, Limited, proprietors of the patent of T. Manly, No. 17,007, 1905, have, through the Press, notified makers and users of such solutions that they render themselves liable to prosecution for infringement of the above patent.

Hints on Working Bromoil.-Harold Baker prefers to use the "carbon-surface" Ilford bromide paper, developed to a somewhat soft print, with full detail in the high-lights and not too heavy shadows. It is found best to bleach as soon as freed from hypo, to dry the bleached print and re-moisten just before pigmenting. When it is necessary to prepare a dried, bleached print for inking it should be soaked for five minutes in water, and when quite limp be placed in a 5 per cent. solution of sulphuric acid for one minute and washed for a few minutes. Full and even treatment in the sulphuric acid bath is a very essential point. When starting to pigment, the print will take the ink all over, and the pale vellow image will disappear, but if the gentle dabbing is continued it will be seen that the colour is taken from the lighter parts and piled up on the darker places, and the longer the action goes on the finer the grain of the deposited ink becomes, while fine detail is secured at the same time. It is best to ink the whole surface of the print in this way, except when there is a sky in the subject, which is best left until the last.

As regards the modes of using the brush, gentle dabbing with a slight smudging produces a smooth surface but slightly obliterates detail; this is sometimes of great value when some parts need to be made less obtrusive. A gentle dabbing with smudging gives a fine grain with plenty of detail, while a hopping action, allowing the brush to fall from the height of an inch, lightens the lighter parts, strengthens the darks, and also brings out detail. If the brush is fixed in a piece of tinned wire, so that the handle of the brush forms a right angle with the wire, this hopping can be done much better and more quickly. But hopping should be used as little as possible; the best prints are those that have been hopped

least.

The finished print should be kept in a place free from dust for a day or two, if convenient, for a week, so that the ink may become thoroughly hard and dry. The whites or lightest tones of the print will improve on drying, and the parts which when wet appeared as blank white spaces, devoid of detail, will show much less white and

with a good indication of form.

As soon as the ink has ceased to be "tacky" it may be protected by varnishing. The best of all is celluloid varnish. Used slightly thinner than that usually sold, it can be poured over the unmounted print pinned to a board or piece of card, just as if it were a negative. In an hour or two the varnish will be quite dry, and the print will now bear a considerable amount of handling, and may be mounted either with any of the various pastes sold for the purpose, or, better still, by the dry-mounting process.—"Phot. Scraps," Mar., 1909, p. 19.

Harold Baker gives the following further hints:—If greater contrast is required in the print, more citric acid may be used in the bromoil solution.

When judging of the proper action of the acid bath, blow a piece



Fig. 1.—Inking.

of the print surface-dry where a high-light comes against a shadow; the former should be seen to be standing slightly above the shadow.

When drying the fixed and washed print, blot off all drops of water; if left on the print they prolong drying and cause patches which may afterwards refuse to take the ink.

It is best to dry before pigmenting; prints pigmented right away will behave as well under the brush as those that are dried on first inking up, but are apt to show loss of detail and lighter tones. On the other hand, the original bromide is best not dried before bleaching.

The photograph shows the position of the brush when inking in the ordinary way, the elbow being rested on the table. The bristles at the toe of the brush press on the paper first and bend and spread a little before the heel of the brush comes down. One soon finds that quick, smart touches produce contrast and detail; very gentle smudging dabs give softness, reduce the sharpness of detail, or even obliterate it.

When "hopping," which should be used as little as possible, a flat-ended brush is used, the movement being to allow the brush to fall from the height of an inch or more, or, as shown in the photograph, fixing it on a wire and giving a series of taps. "Hopping" gives lightening of the light tones and a strengthening of the dark.



Fig. 2.—" Hopping."

In commencing to use a brush just recharged with ink, apply it to a dark part of the subject, using it for lighter portions when the ink in the brush has been reduced; parts which are to be very delicate may be treated with a clean brush, picking up enough ink from surrounding darker parts.

A reasonable time for pigmenting an $8\frac{1}{2} \times 6\frac{1}{2}$ bromoil is half an

hour, though one may spend as long again over the sky.

Dust and hairs being a great trouble in the ink, it is a good plan to take out from the ink tin (which should have a closely fitting lid) enough for one print, cleaning the brushes with petrol before commencing the next print.

A very smooth brush may be made by dipping a brush which has been cut level in hot glue, allowing it to become quite hard by keeping for a day or so and then grinding the end smooth on a fine stone, finally dissolving out the glue with hot water.

Very suitable inks are those of Frank Horsell and Co., Leeds, being those of good quality for half-tone printing. The "Congo black" may be mixed with some burnt umber to give a fine sepia; or raw sienna, sometimes with a small addition of blue, will produce a good greenish-brown, which on ivory (cream) paper gives a suggestion of old parchment. These few varieties of ink are amply sufficient.

The easily damaged surface of the bromoil may be safely protected by celluloid varnish as used for negatives. This allows of prints being dry-mounted, a shellac varnish being inadmissible for this method of mounting. The varnish must on no account be put on with a brush; the best plan is to pour it on as in varnishing negatives. If a pool be poured into the middle of the print and the bottle set down, both hands may be used to flow the varnish over the whole surface, draining it off from one corner and hanging up to dry by the opposite corner.

For spotting bromoils use water colours mixed with ox-gall to make them take to the greasy surface.—"B.J.," Apr. 9, p. 279, and

Apr. 16, 1909, p. 302.

Simplified Formulæ.—C. H. Hewitt dispenses with the acid bath in the Welborne Piper formula (see under "Standard Formulæ"). In place of it he uses a solution of ammonium sulphocyanide 1 oz. in 20 ozs. of water, which works well with Barnet "smooth-ordinary" bromide paper. Further, the sulphocyanide bath acts also as a fixing bath, the bleached print being simply washed in a dozen changes of water, placed in the sulphocyanide bath and again washed, when it is ready for pigmenting.—"A.P.," Mar. 30, 1909,

p. 299.

J. M. Sellors works the process as follows:—Exposing the bromide paper as usual, it is soaked for a few seconds in plain water, developed with amidol, rinsed for one minute under a spray, and placed at once (unfixed) in the bromoil bleacher heated to 80 to 90 deg. F. After bleaching (which lasts from two to three minutes) there is another rinse under the spray for one minute, after which the 5 per cent. sulphuric acid bath is used for from three to ten minutes. After a further one-minute rinse, print is fixed for five minutes in an acid bath, is washed for ten minutes, and is then ready for pigmenting. Process occupies about half an hour in comparison with the 45 minutes necessary according to the usual method.

The amidol developer is:-

 Amidol
 9 grs.
 0 6 gm.

 Sodium sulphite, neutral solution (Piper formula)
 300 mns.
 18 c.c.s.

 Water, boiled to make
 4 ozs.
 113 c.c.s.

This is used repeatedly, and keeps in good working order for two or three weeks.

The time needed to get relief in the acid bath is usually about five minutes, some matt papers requiring up to ten minutes. White light may be used in the dark room as soon as the print is in the acid bath. The image before pigmenting is a fairly visible yellow-green. The following papers have answered well with the process:

—Wellington's platino-matt, special smooth, and cream crayon; Griffin's bromoil; Paget's matt, cream crayon, rough white, cream crayon card, and satin. One of the easiest papers to get relief on is Paget's cream crayon, one or two minutes in the acid bath being generally sufficient for it.

The pigment used throughout was Rawlins' black, mixed when required with ordinary house painters' boiled linseed oil, which is preferable to megilp, as it does not dry so rapidly nor take on a

gloss.

The above method works well with ammonium sulphocyanide, as advised by Hewitt (see above), the only drawback being that with the normal bleacher a much flatter print is obtained than with the acid and hypo. For equal contrast and relief it is necessary to increase the acid in the bleaching solution by 50 to 100 per cent. With this modification of the bleacher the sulphocyanide method gives satisfactory contrast, and allows of a print being obtained ready for pigmenting within twenty minutes.—"A.P.," July 27, 1909, p. 90.

Simplified Bromoil.—The Ozobrome Company have issued directions for a simplified method of converting a bromide print so that it will retain greasy ink in proportion to the silver deposit. The bleaching bath consists of:—

Ozobrome pigmenting solution as sold	1 part
Hydrochloric acid 1 per cent. solution	5 parts
Water	4 parts

The hydrochloric acid solution is made by diluting 2 drs. (fluid) of hydrochloric acid pure (sp. gr. 1·16) to 25 ozs. The bromide print is placed in the above bleaching bath, and becomes in 1 to 3 minutes a faint yellow-brown in colour. It is then placed direct in a fixing bath of

 Water	20 ozs.	1,600 c.c.s.
Нуро	2 ozs.	160 gms.
Liq. ammonia	1 dr. (fl.)	10 c.c.s

where it should remain from two to six minutes according to the original hardness of the bromide emulsion. The hardness of the emulsion can be roughly gauged by the time the image takes to bleach.

If the bleaching is complete in one minute or less it is an indication that the gelatine is fairly soft, and two or three minutes in the fixing bath would be sufficient, but if the time occupied in bleaching is two or three minutes or longer, the print should remain

in the hypo. from five to six minutes.

Finally wash three to five minutes in running water. After removal of the superfluous moisture the print is ready to ink up, or, if convenient, the print may be allowed to dry, in which case it will require to be soaked in water at a temperature of 60 deg. to 65 deg. F. for about twenty to thirty minutes.—"B.J.," Sept. 10, 1909, p. 706.

Photogravure Effects with Bromoil.—C. H. Hewitt describes a method of taking an impression on plate paper (as used for photogravure) in a press from a freshly-made bromoil print. The latter is damped on the back, laid on the bed of the press on a sheet of cardboard cut exactly to the size of plate-mark required. Over the print a mask of thin paper is placed, the opening showing the amount of picture required. The plate paper to receive the impression is now laid over the whole and a pull taken as in ordinary copperplate printing. The ink leaves the gelatinised paper and adheres in full detail to the plate paper.— "A.P.," March 2, 1909, p. 199.

Platinum Printing.

Improving Platinum Prints.—In some notes on the intensification of under-printed platinum prints, Dr. John Bartlett gives the preference to Liesegang's method of treating the washed print with a solution of hydroquinone and citric acid, to which a little silver nitrate solution is added at the time of use. The intensified prints are afterwards fixed in weak hypo. This method did not give the rusty colour produced by the chloroplatinite intensifier. When using stale platinum paper a little potass chromate (the yellow chromate, not the bichromate), added to the extent of 2 drops of 5% solution per ounce of developer will secure brilliant prints. The developer should be used not warmer that 60 or 70 deg. F.—"Journ. of the Franklin Inst.," Mar., 1909, p. 182.

Iron Printing Processes.

(Other than Platinum.)

Blue Prints.—Leslie Truss, in place of "developing" ferro-prussiate paper in water, recommends the following on account of the greater brilliancy, clearness of the high-lights, and good detail.

The negative print (i.e., undeveloped), which should be slightly darker than is usually necessary, on being removed from the frame must be first bleached for about five minutes in the following:—

Water	 8 ozs.	225 c.c.s.
Liquid ammonia 0.880	 40 mns.	2.4 c.c.s.

The ammonia should be added just previous to use and after immersion. The print will be found to be a pale grey positive; this should be well washed for another five minutes in running water and redeveloped in—

Citric acid	1	 . 200 grs.	13 gms.
Water		 . 8 ozs.	225 c.c.s.

Development will be almost instantaneous, the colour being a decided green at first, and the blue print fully developed in about half a minute, after which ten minutes' washing should ensue. The finished print will be found to be quite equal in brilliancy to P.O.P., the high-lights being clear and unstained, and detail

showing well up in the half-tones. Either oxalic or acetic acid, in concentrated solution, may be used in place of citric acid, but the latter gives the most brilliant results, and is the cleanest working bath of the three.—"A.P.," Nov. 24, 1908, p. 492.

True-to-Scale Process.—This process, which has several different names, according to the firms exploiting it, is one by which a few copies (a maximum of about twenty-five) can be obtained rapidly in permanent printers' ink and without any distortion of size. The process is so far only used for architects' and engineers' plans, and diagrams for patent specifications, etc. These are made in the first place in good black ink on tracing paper or linen, and then exposed on to a piece of ordinary ferro-prussiate paper, to make a "blue print." The print is not developed but immediately laid down dry on to a "graph," or jelly, thinly spread on a sheet of glass or zinc. The print is just pressed into contact all over and then directly pulled away. The jelly is now rolled over with a good letterpress ink, by means of a composition roller. The ink will take only on the lines. A piece of paper is now laid on the jelly and rolled over evenly with a light roller, and on lifting will carry the impression of the plan. It is now necessary to ink up again before another copy can be taken. If the work is done on a considerable scale it is convenient to arrange a press for the printing.

The difficulty of the process consists in getting the jelly of the right composition. Here are two formulæ which are said to answer

well. Dissolve :--

Glue	8 ozs. 16 ozs.	225 gms. 450 c.c.s.
Add:—		
Gelatine (dissolved in water to make 2 ozs.)	1 oz. ½ oz. ½ oz.	30 gms. 15 gms. 15 c.c.s.
Gelatine (Coignet's, 1s. lb.) Water Size powder Iron alum (ferric. ammonium sulphate). Water	1 lb. 4½ pints 1 lb. 1½ ozs. 1 pint	450 gms. 2550 c.c.s. 450 gms. 42 gms. 570 c.c.s.

Dissolve the gelatine in the water, then add the size powder. Dissolve the alum in the water, then add to the glue solution gradually, stirring all the time. If the "graph" smells unpleasantly, a little oil of cloves may be added.

The composition is melted by standing in hot water and then poured on to the slab for printing as soon as it has set, as described above. After use it can be remelted and used again, but a little new composition should always be added. It will be seen that the process is quick, easy, and cheap.—"B.J.," May 7, 1909, p. 364.

Molybdenum for Extra-Sensitive "Blue" Paper.—See "Molybdenum Printing Papers," under "Miscellaneous Printing Processes."

Ferro-gallic in Making Positive Copies Direct.—See "Contact Copies of Plans," etc., under "Copying."

Miscellaneous Printing Processes and Prints on Various Supports.

Prints in Greasy Ink from Bromides.—A German patent of A. Tellkampf (No. 201,968 of 1905) describes the use of a bleaching solution of ferricyanide for the production of a printing surface from which proofs in greasy ink may be taken. The ferricyanide bleached print is applied to a gelatine film containing a ferrous salt (prepared from a mixture or 100 gms. of gelatine and 1 gm. of ferrous sulphate in 600 c.c.s. of water). The unaltered ferricyanide in the print combines with the ferrous salt, producing an insoluble salt in the gelatine, which, after this treatment, is able to absorb a fatty ink. From the relief film thus obtained, prints are taken off by contact.—"Journ. Soc. Chem. Indus.," Nov. 30, 1908, p. 1,132; "B.J.," Dec. 11, 1908, p. 937.

Prints on Parchmentised Papers.—L. Griffith has succeeded with the following process, by which plain paper is first parchmentised in an acid bath, home sensitised, a faint image printed, and full strength obtained by development. The acid bath is:—

Su'phuric a	cid	strong	***************************************	4	ozs.
Water				4	ozs.

The paper is immersed in this, quickly raised up, placed on a glass to see that all bubbles are removed, again immersed, and again placed on the glass the other side up to make sure of complete removal of air-bells. A wash in three changes of water, and a further short soak in water containing a little ammonia complete the process, the paper being pressed between blotters and hung up to dry.

To prepare a sensitive surface on this paper, which gives beautiful rich-looking proofs of pleasing brown colour, make the following solution:—

	Potass. iodide	½ gr.	0.065 gm. 0.032 gm.
	Barium chloride		0.65 gm.
	Sugar	10 grs.	0.65 gm.
t	Water, impregnated with camphor	1 oz.	30 c.c.s.

Camphor in aqueous solution may be had of the apothecary.

Take a flat, smoothed, dry sheet of the prepared paper and apply this salting solution with a brush or wad of cotton in the usual way.

Let it lie flat for a minute or two, then hang up to dry. When dry it is ready for the sensitiser:—

B.	Nitrate of silver		6.5 gms.
	Citric acid	4 grs.	0.26 gm.
	Nitrate of uranium	60 grs.	3.9 gms.
	Distilled water	2 ozs.	60 c.c.s.
	Alcohol	d oz.	15 c.c.s.

Dry quickly, but not too near the heat. Expose until the image is faintly visible, about as in a platinum print.

The developer consists of :-

Pyro	4 grs.	0.26 gm.
Citric acid	8 grs.	0.52 gm.
Acetic acid (glacial)	1 drm.	3.6 c.c.s.
Water	8 ozs.	225 c.c.s.

The development is rather slow, being retarded by the quantity of the acid, but this is advantageous. The dish is kept in motion during the development.

Develop the image until it shows considerable intensity, as it

weakens somewhat in the fixing-bath.

The state of the s			
FIXING-BATH.			
Hypo	d oz.	15 gms.	
Water	8 ozs.	225 c.c.s.	
Alum	2 drms.	8 gms.	
Fixing is accomplished in fifteen or twenty	minutes.	The print	is
now placed in-		*	
Alum	50 grs.	3.2 gms.	
Water	8 ozs.	225 c.c.s.	
Let it remain in this bath for half-an-l	or m	ore until	it.

Let it remain in this bath for half-an-hour or more, until it assumes a rich brown colour. Wash as usual with other prints.—" Bull. Phot," Mar. 3, 1909, p. 137.

Molybdenum Printing Papers.—The Neue Photographische Gesellschaft has patented (Ger. pat. No. 206,320, May 9, 1907) the use of molybdenum compounds for the making of papers intended for copying plans, etc. The papers are developed after exposure to light by means of a ferricyanide which forms, with the molybdomolybdate produced, an insoluble, stable, highly coloured image. Eighteen gms. of molybdenum trioxide are added to a solution of 20 gms. of oxalic acid in 400 c.c.s. of water; by crystallisation a mixture of oxalic acid and molybdic acid is produced, which can be coated on paper. For blue tones the developer may contain ferric chloride, potassium ferricyanide, and oxalic acid; for brown tones uranium nitrate; and for red tones copper sulphate is substituted for the ferric chloride. The sensitiveness of ferroprussiate papers is increased by addition of molybdic acid; thus paper may be immersed in a solution of 3 gms. of molybdic-oxalic acid mixture, 2.5 gms. of potassium ferricyanide, 0.5 gm. of oxalic acid, 1 gm. of sodium chloride, 12 gms. of ferric ammonium citrate, and 3 gms. of gelatine in 100 c.c.s. of water. After exposure to light these papers are developed by water.

"Askau" Pigment Prints.—A process has been worked out in Germany by J. Rieder in which use is made of caoutchouc and asphalt in order to form a film capable of fixing to itself a dry pigment powder in proportion to its degree of exposure to light. Caoutchouc alone possesses too little sensitiveness: a small proportion of asphalt remedies this defect. A coating of this mixture is applied to paper, forming a sensitive material which will keep for a month. Printing, as in other dusting-on processes, must be done from a positive transparency, and the exposed sheet of paper "developed" with a mixture of sea-sand and a suitable pigment, which latter adheres to the light-affected portions. The only remaining part of the process is to "fix" the print by applying a lac varnish by means of an air-brush.—"B.J.," Jan. 29, 1909, p. 78.

The Pepper Process.—W. W. Wall gives a revised formula for this variety of the dusting-on process, by which a sensitive coating may be applied to almost any surface, and an image developed by means of powder in nearly any colour or material:—

B.—Solution of 1 in 20, gum dammar and benzole. C.—Solution of indiarubber in benzole, fairly thick

(bicycle cement will do).

For use, take A 10 ozs., B 1 oz., C 1 oz. Filter, and one is ready to coat any hard glazed surface, as glass, opal, or hard-sized white paper, such as the Autotype Company supply. The next procedure is to expose for a few minutes in the sun under a transparency, and then dust over with any litho dry colour, or powdered metals, as gold, silver, bronze, etc., and with a final brushing with a clean soft brush the whole thing is complete.—"A.P.," June 22, 1909, p. 589.

Ceramic Photographs.—M. Anthès and E. Lloyd have patented the use of sensitising solution of honey or other sugar, nitro-cellulose dissolved in ether or acetone with alcohol or other liquid capable of rendering the ether or acetone miscible with water, and, lastly, ammonium or potassium bichromate. This sensitising solution is used as a basis for the dusting-on process.—Eng. Pat., No. 24,214, 1907; "B.J.," May 15, 1908, p. 382.

CATATYPE PRINTING.

Methods of Catatype Printing.—A review by Dr. E. Stenger of the stages in the development of the catatype printing process, and a description of the manipulation of the materials supplied appears in "Moderne Photographische Kopierverfahren," published by W. Knapp.— B.J., Aug. 20, p. 647, and Aug. 27, p. 669, 1909.

THE DONISTHORPE PROCESS.

Opaque Sensitive Film.—For use in conjunction with the dye method of preparing prints by contact in the dark ("B.J.A.," 1909, p. 623), E. S. Donisthorpe has patented an opaque sensitive

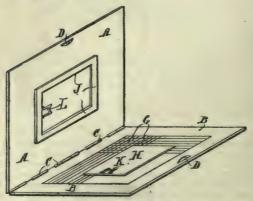
film, in which the support for the emulsion may be black paper, opaque pigmented celluloid, etc.—Eng. Pat., No. 5,641, 1908;

'Apr. 16, 1909, p. 310. " B.J.,

F. W. Donisthorpe has patented an opaque photographic plate, providing a rigid support for the emulsion, of ebonite or black glass, or, it is stated, of paper.—Eng. Pat., No. 7,087, 1908; B.J.," Apr. 30, 1909, p. 348.

Mounting and Mountants.

Dry-Mounting Embossing Folder.—G. W. Morgan has patented a method of embossing or plate-marking prints at the time of drymounting. For this purpose a folder is used consisting of two plates jointed at one side and made of metal sufficiently thin to be easily bent. The folder is opened and a mount to which it is intended to attach a photograph is laid on one of the plates; then the photograph to be attached is laid on the mount, put in correct register, and the other leaf of the folder is gently closed over. The whole is then placed under the mounting apparatus and receives the necessary pressure to secure adhesion.



The plates may conveniently be of different finish to each other; for example, one of them may be highly polished to impart a glossy surface to the print, and the other finely ground or matt surfaced

for a like purpose.

The example shown is adapted for plate-marking, and it may be also used for embossing the mount. There is provided upon the ruled plate B a marking plate H-which may also be surfaced to impress the print. Upon the opposite plate A is a frame J within which when the plates are folded together the marking plate H fits. A device such as the monogram K may be formed in intaglio in the marking plate H, or be attached thereto, while the counterpart relief L is formed in or attached to the plate A.

In operation, the folder is opened; the print laid face down in proper position upon the marking plate H; the mount—of course, of sufficiently thin material—is superposed and the whole closed and subjected to pressure.—Eng. Pat, 3,727, 1908; "B.J.," Dec. 4, 1908, p. 928.

Some further particulars of the system and of the self-adhesive paper to be supplied coated with print-out or development emulsion are given in an account of the demonstration of the process held at the premises of Messrs. O. Sichel and Co., in "B. J.," Apr. 9, 1909, p. 292.

A later article by G. W. Morgan appears in "B.J.," Apr. 23, 1909, p. 325.

Dry-Mounting.—In using an ordinary flat-iron for applying heat to the print in attaching it to the mount by means of shellac tissue, G. Bealby recommends the use of the yellow copying-press paper (as sold by stationers) for laying upon the print when applying the iron. For keeping this latter, or, rather, two of them, at a convenient temperature, between 180° and 212° F., two irons are placed in a large shallow dish containing about an inch depth of water, which is kept at the boil over a gas stove. One iron or the other is thus always at the necessary heat, and dries almost instantly on being taken from the water.—"A.P.," Feb. 16, 1909, p. 153.

Gutta-percha Dry-Mounting.—Dr. J. Neubronner prepares a dry mounting film or tissue by coating paper on both sides with a solution of gutta-percha, or passing paper through a solution of the latter. The paper is then treated by heat in order to saturate the pores with the liquid. It then becomes semi-transparent and of the appearance of parchment, and is dried and rolled. This may be done without fear of its sticking. The tissue is placed between the mount and the photograph, and, on application of heat, unites the two, the gutta-percha acting as an insulating film and protecting the photograph from impurities, if any, in the mount.

The gutta-percha solution may be applied to the back of the photograph and the latter affixed directly to the mount by hot pressure.—Eng. Pat No. 13,253, 1908; "B.J.," Dec. 25, 1908,

p. 964.

Enlarging.

Vertical Enlarger with Supplementary Lenses.—Dr. H. D'Arcy Power records the great convenience of a vertical or skylight type of enlarger, in which the negative is laid on a horizontal shelf (fixed), the lens mounted on a similar fixed shelf (A in Fig. 1), and a series of shelves provided below for different scales of enlargement. The same lens is used throughout, but is combined with a positive supplementary lens (shortening the focus), when a lesser degree of enlargement is required than that which the lens alone will give within the limits of the apparatus. Thus, in the case of a 7-inch

lens placed 8½ inches from the negative and 42 inches above the floor an enlargement of four diameters is obtained. The following

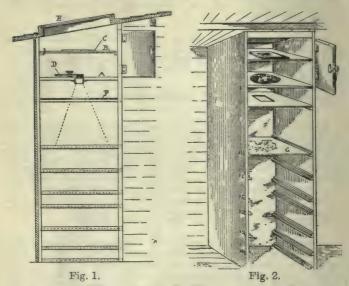


table gives the spectacle lenses required, the distances from lens to sensitive paper (for sharp focus), and the magnifications thus obtained:—

	Distance to
Lens.	Paper Shelf. Magnification.
7-inch lens alone	41½ inches 4 diameters.
7-inch lens plus 0.12 spectacle lens	38 inches 31 diameters.
7-inch lens plus 0.25 spectacle lens	
7-inch lens plus 0.50 spectacle lens	29 inches 24 diameters.
7-inch lens plus 1.00 spectacle lens	
7-inch lens plus 1.25 spectacle lens	
7-inch lens plus 2.00 spectacle lens	
A	4

It will be seen that the supplementary lenses are mounted in a rotating disc, D, so that any one can be quickly brought into position. The positions of the focussing easel or paper are best found by trial with a test plate. The method further lends itself to vignetting and printing-in clouds.—"Cam. Craft," May, 1909, p. 163; "B.J.," June 18, 1909, p. 475.

Calculating Exposures in Enlarging by Artificial Light.—N. C. Deck uses a density scale negative as a means of classifying nega-

tives and estimating exposures in enlarging. The method applies to negatives all made with the same developer which has also been used in making the scale negative. This latter is printed by contact from a set of graduated strips built up like the multiple-tint actinometer frequently used. Ten gradations representing from one to twenty-six thicknesses of fairly transparent paper are numbered. On the negative the most transparent set is marked 1, and so on. From each of the negatives to be used a perfect contact bromide or gaslight print is taken, exposing and developing both at the same time. The highest number which can be read in the gradation images is thus the "density number" of each negative.

In enlarging, the ordinary negative is first adjusted in the carrier and the enlargement focussed. The gradation negative is then inserted and trial strips of bromide paper exposed across the numbered bands of the gradation negative, giving a series of seven exposures, each double the preceding, from 10 to 640 seconds. The strip is developed and fixed, and the number produced at each exposure noted. As these strips will show a series of density numbers, it will be clear that under the working conditions at the time the exposure for a negative found to have a density number of 14 will be that required to produce No. 14 on the test strip. If the scale of the enlargement is changed allowance must be made for the fact.—
"Aust. Phot. Journ.," Nov. 20, 1908, p. 322.

Focusing Enlargements Near to Easel.—W. Pollock has patented a gear mechanism providing an adjustable rod affixed to the rack and pinion of the camera. This latter may be actuated from the other end of the rod, which is close to the easel, and thus allows of the enlargement being focussed whilst the operator closely examines it. Eng. Pat. No. 21,328, 1908.—"B.J.," Jan. 8, 1909, p. 28.

Soft Enlargements.—André Callier has shown that if the "scatter" of light from a negative be prevented by binding the surface of the negative with a piece of opal glass the increased contrast which is produced in an enlargement is obviated.—"Phot. Journ.," Apr., 1909, p. 200, and "B.J.," Apr. 30, 1909, p. 343 (see under "Negative Processes—Sensitometry.")

In Place of Bolting Silk.—H. Mills uses chiffon (two thicknesses) placed in the rim of a lens cap on the hood of the enlarging objective. This he finds to give a certain softness of definition without, however, destroying detail.—"A.P.," Aug. 24, 1909, p. 190.

Ernest Marriage advises the use of a portrait lens such as the Dallmeyer B., adjusted for soft focus, in place of using bolting silk for making soft enlargements. The enlarged print is free from "textile" structure, and exposures are less. The method has the advantage over using an ordinary lens and putting the 'mage out of focus that the fine detail in the negative is preserved in the enlargement.—"A.P.," Oct. 5, 1909, 334.

Enlarged Negatives on Paper and Glass.—See "Reproducing Negatives," end of Section IV.—" Negative Processes."

Photo-Sketches.—Nelson K. Cherrill has suggested the making of enlarged prints from negatives purely by a hand method, which consists in projecting the negative upon a sheet of white absorbent paper, such as Whatman's water-colour sketching board, and after sharp focussing proceeding to fill-in with brush and colour all the light parts seen on the paper, so as to obtain one uniform tint all over. This is done by a weak light, such as that of a candle placed five or six feet from the paper in the case of a 15 x 12 enlargement projected from quarter-plate with an eighty-candle lamp. The result is to place upon the paper an image which is the positive corresponding to the negative. It is stated that the work calls for no special skill.—"Phot. Monthly," May, 1909, p. 97.

Lantern Slides.

Lantern Slides Direct in the Camera.—Douglas Carnegie has further simplified the method of making diagram slides direct in the camera by reversal ("B.J.A.," 1909, p. 632) by exposing through the glass of the lantern plate, the focussing screen of the camera being likewise reversed. On account of small differences which may exist between the thickness of the lantern plate and the focussing screen, the lens is used stopped down to f/11. The developer is:

A.	Metol		1.8 gms. 6.8 gms. 65.0 gms. 3.0 gms. 1000 c.c.s.	
В.	Sodium carbonate (crystals)	2 ozs.	65 gms.	

For use, equal parts are taken of A and B. In very warm weather it is advisable to increase the amount of bromide. This developer is very well suited to intermittent work, as it has excellent keeping qualities.

Metol is used in this formula in order to allow of the use of sodium carbonate as the accelerator, caustic soda or potash not

being suitable for the process.

The exposed plate is placed, film up, in the developer, covered, and left for five minutes. At the end of development the image should be clearly visible on the film surface. The plate is now well rinsed in the dish for one minute, and then flooded with the reversing solution, by which the silver image is dissolved. When rinsing the plate should always be temporarily removed from the dish, and the dish itself rinsed out. Otherwise solution is persistently retained by the capillary space between the plate and the dish bottom.

In place of potass bichromate as the reverser amonium bichromate is used, this formula avoiding the slight opalescence of the film caused by the potass salt. The reverser is:—

bath, is ready for re-exposure and re-development.

Since during the re-exposure the plate must be exposed in the developer glass side up, provision must be made that the film itself does not come into contact with the bottom of the developing dish. This is secured by sticking (by means of coaguline) narrow strips of glass on the bottom of the tray (preferably a black one) at either end, so as to act as small shelves for the plate. The previously used developer is poured into the dish; one end of the plate, itself held in a slanting position, is immersed, and then the other end of the plate gradually lowered, till it is completely immersed. This method of inserting the plate must be followed, for air-bubbles in contact with the film would be fatal. If the plate is first placed in position on the shelves in the dish and the developer then poured in, bubbles are a moral certainty. The plate is rocked in the developer for half a minute, the dish placed on the floor, and threequarters of an inch of magnesium ribbon is burned at a vertical distance of 3 ft. above it. The plate is then left covered for five minutes, when secondary development will be complete. Fix in an acid fixing-bath and wash.

When soft results are required (as, for instance, in making a slide from a photograph with a delicate range of tone gradation), magnesium light should not be used for the reversal exposure. In such cases the weaker light of a number 4 flat-flame gas burner is to be preferred. The light from a gas pedestal, about a foot high and standing on the table, may be conveniently reflected by means of a mirror on to the plate as it lies glass side up in the developing dish. The mirror is clamped at an angle of 45° to the vertical a foot above the dish, and the gas flame is placed some 18 ins. from the mirror. The light is kept on during the whole time of development, the duration of development being now regulated by inspection of the

plate and the character of the slide required.

Even if there be no appreciable fog, short immersion in a reducing bath always enlivens and brightens up a diagram slide. The best method of procedure is as follows:—Place the plate for n minute or so in water to which enough potassium ferricyanide has been added to colour it distinctly yellow. Wash, and then immerse in a very weak hypo bath. If there has been fog or veiling of the background, and it is not yet removed, repeat the process. Do not expect the veiling to disappear in the ferricyanide solution. This plan of applying the Howard-Farmer reducer in stages removes fog or veiling without detracting from the pluckiness of the image, as the employment of the mixed reducer is very apt to do.—"B.J.," July 9, 1909, p. 528.

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Masking Diagram Lantern Slides at Time of Exposure.—Douglas Carnegie has devised the following copying easel, serving to obtain masking of a diagram or other original when copying for lantern slides, the method having the advantage that it dispenses with a paper mask in the slide, and thus avoids the dewing of slides in the lantern resulting (to some extent) from moisture in the mask. The diagram to be copied is trimmed up square, and the copying-board on which it is supported during exposure is covered with the best black velvet. For the purpose of fixing diagram to the copying-board—a plan which gives truly rectangular masking—two thin slips of wood of the same length as the board, and about 2 ins. wide, are bevelled off sharply along one edge. The slips are then covered both sides with black velvet, using Higgins' vegetable glue as adhesive.

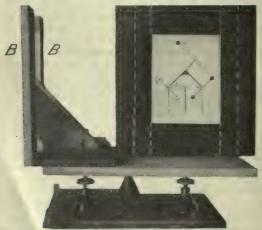


Fig. 1.

If the diagram is placed in position on the board, and the covered laths be pressed on the board so that their bevelled edges slightly overlap the right and left-hand edges of the diagram, they will adhere to the board and firmly support the diagram, in virtue of the interlocking of the piles of the opposed velvet surfaces. Fig. 1 represents the copying-board with a diagram fixed thereto as described; the dotted lines touched into the print indicating the positions of the photographically invisible supporting laths.* Fig. 2 represents the arrangement of the board when copying from books. The method of supporting the book by the adjustable brackets B B is indicated. The dotted lines again show the position of the lath, which is keeping the page taut and flat against the surface of the

^{*} The copying-board as described is supplied to order by Messrs, Butcher and Curnow, Blackheath.

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board. The hinder edge E of the board is bevelled off, so as to fit snugly into the angle that a reflexed book presents. By this device a perfectly flat page is expeditiously secured, and this without any detriment to the book. Unfortunately, there is no avoiding the ordinary paper masking in the case of copying diagrams which only form portions of a book page.



Fig. 2.

As regards binding, it is of little avail to dry the slide and its mask if the finishing touch is the application of a substance so hygroscopic as gum. The adhesive tape sold for surgical purposes is a very efficient binder, but it is rather coarse and unsightly. The same objection of unsightliness and lack of finish unfortunately applies to the method of fixing the cover-glass by an edging of "Cementium" or Stickphast cement. There would seem to be a good opening here for the trade to supply an easily applied dry adhesive binding. *—"B.J.," July 9, 1909, p. 528.

WARM-TONED LANTERN SLIDES.

Diachrome Toning.—E. Coustet states that the following solution acts perfectly for the bleaching of transparencies to be toned by the Traube method ("B.J.A.," 1909, p. 631):—

 Iodine
 2 gms.
 30 grs.

 Water to make
 100 c.c.s.
 3½ ozs.

^{*} Dry adhesive binding is supplied by J. Neubronner and Co., Cronberg-on-Taurus, Germany.—Ed. "B.J.A."

The slides are bleached in this solution until white or yellowish when seen from the back, and are then rinsed, and dyed in one or other of the colouring matters suitable. M. Coustet mentions methylene-blue, auramine, and erythrosine. A longer list was given in the 1909 "Almanac," p. 631, by Dr. Novak.—"Photo-Gazette," Sept. 25, 1908, p. 199.

Warm Tones on Lantern Plates.—Messrs. Wratten have found that the fineness of division of the silver image is the cause of warmness of tone in lantern plates, a fact which has led them to work out a bromide lantern plate, with which type of emulsion developers containing solvents of silver bromide, such as hypo, etc., may be used as a means of forming a very fine (warm-toned) image. As a result, also, of the image becoming coarser in grain as development proceeds, they recommend the alteration of the developer as well as of the exposure for obtaining any given colour, a fixed time of development being adopted for each developer. They also find that a fine series of bluish tone may be obtained on the bromide plates by means of an acid (physical) developer consisting of

Metol	88 grs.	2 gms.
Citric acid	1 oz.	10 gms.
Water	10 ozs.	100 c.c.s.

To which add one-tenth of its volume of 10 per cent. silver nitrate solution.

The exposure in this case requires to be about four times the normal, and dishes, measures, etc., must be used scrupulously clean.—"B.J." (from "Lantern Slides," issued by Wratten and Wainwright), Sept. 17, 1909, p. 726.

Increasing the Power of Limelight.—C. E. S. Phillips draws attention to a very simple method of increasing the power of limelight, and his expedient may at times be very useful. He simply puts an incandescent mantle over the lime.—"B.J." (from "Nature"), Nov. 20, 1908, p. 882.

Douglas Carnegie reports that tests made with both hard and soft limes with and without an incandescent mantle showed no measureable improvement produced by the latter.—"B.J.," Mar. 12,

1909, p. 206

CINEMATOGRAPH.

Non-flammable Cinematograph Film.—A. Lumière et ses Fils prepare a film which, when finally used in the cinematograph machine, consists only of gelatine. They coat a polished glass surface with collodion to form a temporary support. They then apply a gelatine coating sufficiently thick to serve as a cinematograph film when detached, and finally apply the emulsion coating to the collodion-gelatine film. The combined film is exposed in the cinematograph printing machine, and is developed, fixed, dried, etc., in the ordinary way. The collodion support is then stripped away from the gelatine film and the latter used alone.—Eng. Pat. No. 16,114, 1908; "B.J.," Apr. 23, 1909, p. 328.

Cinematography in Natural Colours .- G. Albert Smith, in conjunction with the Chas. Urban Co., has worked out a method of cinematographic projection in natural colours, which was very successfully demonstrated before the Royal Society of Arts on December 9. The method employed is a development of the additive process, except that Smith uses only two filters, a red and a violet, in making and projecting his colour records. Commercial cinematographic film is bathed in a dye bath to give it the necessary coloursensitiveness. The filters are mounted as sectors in a rotating disc, a similar disc being used in the projecting machine. Thirty-two pictures, sixteen for each sensation, are taken per second, and are combined in the eye of the observer when projected on the screen. The results shown were remarkably good, and several cinematographic renderings of scenes which in the quiescent state had been photographed on Autochrome plates showed the range of colours rendered on the two-colour system.—"Journ. Soc. Arts," Dec. 11, 1908, p. 70; "B.J.," Dec. 18, 1908, p. 960.

Capt. W. N. Lascelles Davidson has patented a modification of the two-colour method of cinematography in colours by additive projection, the essential part of the invention being the use of colour filters travelling over the band of sensitive film (at the time of exposure) or with the positive film (at the time of projection) at

about the same rate.

Instead of employing a revolving shutter fitted with, say, red and bluish-green colour screens as described in Patent No. 26,671, 1906, there is used a length (preferably an endless band) of multi-coloured film, which is caused to travel in any suitable manner with, or at about the same speed as, the colour-sensitive film, the band of film being so coloured or dyed that the respective colours thereon are the size of each of the series of pictures exposed through the colour screens throughout the film.

A series of negatives is thus obtained in which, say, the reds and yellows are recorded in one negative, and, say, the blue-greens and yellows in the second, alternately throughout the length of the

film.

A series of positive colour records (preferably of a neutral grey black tint) are made from the above negative colour records, and projected on the screen through any commercial projecting machine with a similarly coloured multi-coloured colour screen, so that the pictures are projected in quick succession in the desired order through their respective colours.

There can thus be obtained one picture to every complete revolution of the exposing or projecting shutter, and it is thus possible to both take and project pictures in colours at about the same speed as ordinary black and white animated pictures.—Eng. Pat. No. 253,

1908; "B.J.," Feb. 12, 1909, p. 126.

(Space will not permit of reference to the numerous patents for cinematograph cameras and projectors. The specifications are published or abstracted in "The British Journal of Photography," and entered in the annual index of that publication under (1) Cinematographs and (2) Name of Patentee.)

VI.—COLOUR PHOTOGRAPHY.

Patents for Colour Photography.—The chronology of the patent specifications relating to colour photography commenced in the monthly "Colour Photography," Supplement to the "British Journal of Photography," is concluded with the issue of December 6, 1907, p. 96.

Experiments in Colour.—A description of apparatus used by t! > Leipsic School of Graphic Arts in teaching the principles of light and colour and exhibited at the Dresden Exhibition is given in "B.J.," June 18, p. 476, and June 25, p. 499, 1909.

Direct Interference Processes (Lippmann).

The Lippmann Process.—H. E. Ives has made a series of experiments in order to discover the most favourable conditions (of thickness and grain of emulsion, developer, etc.) for the reproduction of (1) pure monochromatic colours, (2) mixed colours, (3) white, and (4) natural scenes. In the course of his experiments he found that what is best for one of these is not best for others, and he further worked out a portable substitute for the mercury mirror, of particular value when using the Lippmann process in the field.

The following are his directions for making the latter: A glass plate is heavily silvered, and then flowed with a thick solution of celluloid in amylacetate. When this varnish is dry, the plate is placed under water; this slowly works under the coating of celluloid, lifting it from the glass, and bringing with it the silver. This flexible silver mirror is immediately laid, silver surface down, on a wet Lippmann plate, and allowed to dry there, a necessarily somewhat slow process. When dry, the gelatine film has the silver surface in optical contact with it. The plate may then be exposed at any time in an ordinary plate-holder. After exposure, the celluloid film is stripped from the gelatine, taking with it most of the silver, the plate developed, and after thorough washing the remains of the silver removed with a tuft of wet cotton.

This substitute works perfectly for all types of colours, and, except in the laboratory, where a convenient dark-room makes the use of the mercury mirror simple, facilitates the practical working

of the process.

A difficulty which has proved rather troublesome is that some of the best sensitisers are apt to lose their effect during the slow drying. Erythrosin acts perfectly; pinacyanol and pinaverdol are apt to fail. This can probably be overcome, either by different choice of sensitisers, by so treating these that slow drying does no harm, or perhaps by finding some more porous substance than celluloid, which, acting the same in other respects, will permit of quick drying. Collodion has been tried, but has not been found to strip off the gelatine well.—"B.J." (from "Astro-Physical Journal"), Dec. 11, p. 942; Dec. 18, p. 965; Dec. 25, p. 979, 1908.

Journal"), Dec. 11, p. 942; Dec. 18, p. 965; Dec. 25, p. 979, 1908.

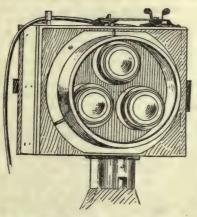
Dr. H. Lehmann, of Jena, gives a full description of the contributions made by himself to the Lippmann process in "Phot. Rund.," Heft 11, 1909, p. 125. Reference is made to the grainless plate for the process now made by R. Jahr, of Dresden, and to the portable mercury dark-slide, viewing instrument, and

projection lantern made by Carl Zeiss.

Three-Colour Processes.

APPARATUS FOR THREE-COLOUR PHOTOGRAPHY.

A Three-Lens One-Exposure Colour Camera.—A. Chéron, who has in the past devised several cameras for obtaining colour photographs at one exposure by dividing the image formed by the lens into a series of spectra ("B.J.A.," 1909, p. 668), has now adopted



as more simple and practical for ordinary work a camera made with the three lenses placed as close together as the mounts will permit, the body of the instrument being divided into three compartments of triangular shape. As shown in the photograph, all three lenses can be uncovered at once with a cap or shutter, and the rim also serves for the attachment of one large lens when photographing near objects. The filters (Wratten) are contained in the camera, and a single negative gives three colour-sensation records about 14 ins. diameter. A positive from this negative is placed in the camera back and suitably illuminated, a large lens (placed over the three taking lenses) thus allowing of the small pictures being projected in colours. For discs up to 3 ft. diameter an ordinary incandescent alcohol lamp is found sufficient. Though not theoretically perfect, "Phot. Couleurs," Jan., 1909, p. 11; B.J." (Colour Supplement), Mar. 5, 1909, p. 21.

[It should be mentioned that the device of employing three lenses placed as close to one another as possible, as illustrated by M. Chéron, has already been suggested by Hans Schmidt ("B.J.," Feb. 8, 1907, p. 694). Herr Schmidt, however, by the use of two prisms caused the images to fall on three separate plates. Also Sydney L. Young writes in the "B.J." (Colour Supplement), Apr. 2, 1909, that a similar camera with three lenses mounted close together has been used by him for three or four years previously. -Ep.1

Lens for Colour Photography.—A patent has been taken out by the S.A. La Photographie des Couleurs, J. Sury, and E. Bastyns for a lens composed of two, three, or more glasses of prismatic triangular form, so as to form three separate images. Eng. Pat. No. 27,793, 1908.—"B.J.," June 18, 1909, p. 481.

Three-Colour Prints.

Three-Colour Pigment Prints.—E. Clifton and A. E. Wells have patented improved methods of preparing colour prints by the carbon or other process, such as Stannotype, in which gelatine reliefs containing a pigment or colour are laid one on each other to form the colour print. In order to obtain a number of prints even or uniform in character they use a series of dye solutions in one or other of which any one of the component prints is immersed in order to strengthen or modify its colour. Thus, the yellow print may be given a bath of red, orange, or blue dye, the blue print may be dipped in a solution of yellow dye to render it greener, and the red print may be treated with a blue or violet dye to increase its purple character. As suitable dye for the purpose the authors name for the blue, induline blue, Lyons blue, or Hoffmann's violet (blue shade); for the yellow dye, naphtholyellow or berberine; for the orange dye, chrysoidine or aurine; for the red dye, alizarine, cochineal red (or carmine with ammonia) or Magdala red. These dyes are used of a strength of about 25 parts of dve per 1,000 parts of water or weak alcohol.

The second improvement in the process consists in means for examining all three prints placed in such a way that the final result may be judged. For this purpose the prints are arranged in a registering frame provided with adjustments whereby the three differently coloured images whether supported on glass or celluloid may be brought into coincidence, although separated by a small

space, as must be done owing to the dampness or wetness of the prints. The diffused effect caused by this separation is avoided by observing the print (reflected in a mirror placed at a considerable distance) by means of a telescope close at hand. Observation having then shown that the colour prints have been properly adjusted for tint and depth they may be successively transferred to a prepared paper or piece of celluloid, as in the double transfer method of carbon printing.

In order to facilitate the registration, marks are photographically produced on the negatives made in the first instance, and thus occur on all the prints.—Eng. Pat. No. 23,615, 1907; "B.J.," Feb.

26, 1909, p. 163.

Three-Colour Prints by Modified Diachrome Process.—R. Namias has suggested the use of lead sulphate and of lead oxide for fixing dyes, as in the diachrome process of Traube ("B.J.A.," 1909, p. 631). A positive transparency is bleached in a solution of lead ferrocyanide, washed for half an hour, treated for ten minutes in a 2 to 3 per cent. solution of nitric acid to remove traces of lead oxide, and then placed in 10 per cent, hypo solution to remove the ferrocyanide of silver, but to leave an image of lead ferrocyanide.

The yellow image of a three-colour print may be formed by treating the lead ferrocyanide positive with 5 per cent. solution of potass bichromate. This, when making a print on opal support

to be viewed by reflected light only.

For the three-colour transparency the positive plates treated as above are further placed in an acid solution of sodium sulphate, which converts the image into one of sulphate of lead. This acts as a mordant of the dyes, auramine proving suitable for yellow, saffranine for red, and methyl-blue for blue. In order to remove the lead sulphate from the dyed plates the latter are first treated in 1 per cent. copper sulphate solution, and then placed in hypo solution containing boric acid.

If, instead of treating with acid sulphate solution, a 1 per cent solution of caustic potash be used, the image consists of hydrated oxide of lead, which serves to fix the colours, and is less opaque than the sulphate so that there is no need to remove it.—"Phot. Couleurs," July, 1909, p. 145; "B.J." (Colour Supplement), Sept.

3, 1909, p. 69.

One-Plate Three-Colour Processes.

PROCESSES OF PREPARING SCREEN-PLATES.

Under this heading are described processes, the products of which at the time of writing (Sept., 1909) are not on the market.—Ed. "B.J.A."

Lumière Screen-Plate.—An English patent has now been granted to the Société Anonyme A. Lumière et ses Fils for the process of preparing a screen-plate of geometrical design described in "B.J.A.," 1909, p. 642.—Eng. Pat. No. 20,111, 1908; "B.J.," May 7, 1909, p. 366.

Dufay Screen-Plate.—The full specification relating to the Dufay screen-plate, No. 11,698, 1908, is given in "B.J.," Mar. 19, 1909. The details of the process have already been published in "B.J.A.," 1909, p. 642.

Some further details are given in an article by "T. R." in "Phot. Couleurs," Mar., 1909, p. 59.

A further patent has been taken out by M. Dufay, in which a greasy resist is used in the first instance, the plate being then dyed in the unprotected parts, varnished with a preparation which does not dissolve the resist, and the resin of which is insoluble in a solvent of the resist. The varnish may consist of gum-lac dissolved in alcohol. A solvent of the greasy material, e.g., benzole, is then applied, and the surface (thus laid bare) given a second application of the resist over half each area only and again dyed. I mally, after a second removal of the resist a third colour is put in by dyeing the plate as a whole.—Eng. Pat. No. 18,744, 1908; "B.J.," Oct. 8, 1909, p. 786.

Gelatine Grain Process.-J. Bamber has patented a method (for application to celluloid) of forming the three-colour mosaic niter by means of a mixture of coloured grains of transparent gelatine, which are applied to the sheet of celluloid, allowed to expand by standing in moist air, or by application of a gelatine solution. then dried and rolled into contact with the celluloid, and finally varnished. The process is similar in principle to the Lumière starch grain. The coloured gelatine particles are said to be made by first dyeing the gelatine, soaking in 15 per cent. formaldehyde, again drying, immersing in water in order to produce maximum expansion, and then (the gelatine being now in a brittle state) reducing to a fine granular condition in a grinding mill at a temperature of about 200° F. The gelatine powder is then separated into grains of various grades of fineness by a process of elutriation, using petroleum spirit of 0.700 sp. gr. or other liquid not absorbed by gelatine. In this way batches of grains up to a fineness of 1-3000-in. in diameter are stated to be obtainable.—Eng. Pat. No. 3,252, 1908.—"B.J.," Oct. 16, 1908, p. 796.

Ceramic Screen-Plate.—H. W. H. Palmer has patented a method of preparing the screen-plate for colour photography on the lines of the Autochrome plate, by the following method:—Glass plate is first of all coated with a suitable tacky substance, and then with ceramic colours or fluxes in the proper proportions of the necessary colours to form a three-colour filter-plate. This coloured coating is then fired in a kiln or furnace, leaving a coloured transparent glaze formed of the minute particles of the colouring matters. The treatment in the furnace fills up any minute space between the coloured particles. The colours used are composed of silica, minium and borax (with saltpetre, added if necessary). This base is coloured with oxide of cobalt for the blue, copper oxide or oxide of chromium for the green (with the addition of ferric oxide to either of the former for the red), ferric oxide or chromate of lead

for yellow or orange and gold, with oxide of tin for magenta or pink.—Eng. Pat. No. 22,228, 1907.—"B.J.," Nov. 13, 1908, p. 873.

Szczepanik Imbibition Process.—Jan Szczepanik has patented methods of preparing the mosaic colour filter which are based on the behaviour of acid basic dyes towards vehicles such as gelatine, collodion, etc. Three lots of fine gelatine particles, each stained with a suitable dye, that is one having a stronger affinity for collodion than for gelatine, are mixed together and applied to a tacky collodionised substratum. The dyes migrate into the collodion surface, leaving the powder colourless. Where coloured particles overlie each other, uncoloured patches may be formed in the substratum; but this defect may be remedied by, say, applying only two lots of particles and afterwards producing the third colour by treating the support in a bath containing the third dye dissolved in a substance such as gelatine from which the dye will pass into the collodion.

A number of variations of this method are described. The substratum may be sprayed with coloured liquids containing gelatine, or a portion of the plate may receive an impression (pattern) in colourless gelatine, and a second impression given in a varnish colour. The whole plate may be then immersed in a mixture of dyes (e.g., methylene blue and erythrosine) which will not affect the varnish impression, but will stain the gelatine red and the

collodion blue.

Another method is to stain a set of three filaments with three colours and form from them a tissue or fabric.—Eng. Pat. No. 17,065, 1908; "B.J.," Nov. 13, 1908, p. 874.

Szczepanik-Hollborn "Veracolor" Screen-Plate.—Dr. F. Limmer has contributed notes dealing with the share taken by Dr. K. Hollborn, of Leipsic, in working out the Szczepanik process of preparing a screen-plate by applying dyed particles of gelatine to a collodion surface; the dyes transferring themselves from the gelatine to the collodion. It was found easier to obtain a fine powder when using gum in place of gelatine. It was also found that the condition of such transference is the presence of a slight proportion of the substance in which the dyes are soluble. A mixture of gelatine and cane-sugar was found to serve very well in conjunction with dyes soluble in water and alcohol. Afterwards milk-sugar alone was used, and it was found well to add a substance to the collodion which prevented it drying too quickly. Two of the dyes are applied by transference, and a third by a bath of colour.—"B.J." (Colour Supplement), July 2, 1909, p. 49.

New Warner-Powrie Screen-Plate.—Dr. W. Scheffer has described a new type of screen-plate prepared (spring of 1909) by the promoters of the Warner-Powrie process. The plate is of geometrical pattern, consisting of red and blue areas and crossing green lines, its fineness of structure is almost that of the Autochrome, and the separate elements show very uniform colouring throughout each unit area.—"B.J." (Colour Supplement), June 4, 1909, p. 43.

Colouring Celluloid for Mosaic Screen-Plates .- F. Lehner employs dyes soluble in water, but not in spirit, by rolling or kneading the celluloid with spirit containing as much water as possible, and adding the colours solid or in solution. The water thus serves as a carrier of the colours, which, but for its use, are insoluble in the celluloid. The dyed mass of celluloid, when rendered homogeneous, is partly deprived of its water by heating after the last addition of colour, and is then formed into films. The last portions of water are removed by drying the films for several days. The hardness of the films, caused by protracted drying, is remedied by exposure to vapours of strong spirit or absolute alcohol. Dyes soluble in water, though difficultly soluble in spirit, are stated to be as follows: —For red, Ponceau F.R. (Casella and Co., Frankfort-on-Main), or Ponceau 4R (Hoechst). For blue, "silk blue" (Seidenblau R. of Casella and Co.), or "cotton light blue" (Baumwoll-lichtblau, Hoechst). For green, concentrated acid green (Säuregrün conzentriert D, Hoechst) or Naphthol green (Naphtholgrün B, Casella). For yellow Naphthol yellow (Naphtholgelb S, Badische Anilin u. Sodafabrik, Ludwigshafen), or "Acid yellow" (Echtgelb G, of the same firm).-Eng. Pat. No. 7,629, 1908; "B.J.," Jan. 16, 1909, p. 49.

Shellac Grain Screen Plate—J. Herman proposes to manufacture a mosaic colour screen-plate composed of particles of shellac suitably dyed. He prepares the dyed solutions of shellac in spirit, and then forms an emulsion of the shellac in turpentine, either by the simple addition of the shellac solution to turpentine or with an emulsifying machine. The shellac particles are obtained of larger or smaller size by allowing different times for subsidence, and the emulsions thus prepared are applied either separately or in admixture to a plate coated with a thin layer of shellac, to which the shellac particles in the emulsion attach themselves and are caused to adhere by heat or pressure.—Eng. Pat. No. 20,971, 1908; "B.J.," Apr. 2, 1909, p. 269.

Mosaic Grain Screen Plates.—C. L. A. Brasseur has patented the following process of making a grain filter screen, the colour elements in which are flat on both sides, are thin, and touch each other:—Particles of dyed celluloid or other plastic transparent material are cut from a sheet into pieces about 1-500th to 1-1,000th of an inch square, and are rolled between discs to render them roughly spherical, when they are sifted (to grade them as to size) and again rolled. They are applied to a celluloid support by a transfer method—that is, they are first applied to paper coated with an adhesive which loses its stickiness when completely dry (e.g., gum). When the paper has been covered with the mixture of tiny spherical particles, it is rendered adhesive by moisture, the grains thereby fixed, and the excess brushed off. This coating is then applied to the celluloid sheet, and the two brought into contact under heat and pressure, when the particles adhere together, flatten out, and are fixed to the film support. In this way, it is claimed,

the particles do not run together and become irregular in shape, as is the case when applied direct by pressure and heat to the celluloid. Means are described for filling up any interstices left in the coating of coloured particles.—Eng. Pat. No. 18,750, 1908; "B.J.," Feb. 19, 1909, p. 145.

Celluloid Mosaic Screen-Plates .- The Vereinigte Kunstseidefabriken A.G. have patented the following method of preparing a three-colour mosaic filter-screen from an engraved or etched metal matrix :- The process consists in forming a pattern in relief on the celluloid sheet by hot pressure against the etched plate, the depressions in which form the portions raised above the celluloid surface. The latter is then inked like a printing-plate with greasy ink or varnish, which is thus applied to the raised lines or bands. whole sheet is then treated in an alcoholic bath of dye whereby the depressed portions absorb colour, and the greasy ink then removed. The sheet is then placed across the etched plate at right-angles to its former direction, and a second hot pressure given, the raised lines again inked, and a second application of alcoholic colouring solution, such as malachite green, carried out. A two-colour screen is thus obtained with lines crossing each other at right-angles: the raised portions left uncovered at this stage are given a coating of dye by any suitable method, such as sensitising with bichromated gelatine solution, exposure to light and dyeing in an aqueous dye solution. The process is completed by hot pressure of the whole sheet between flat plates in order to get rid of the relief .- Eng. Pat. No. 21,739, 1908; "B.J.," Feb. 19, 1909, p. 146.

The Vereinigte Kunstseidefabriken A.G. has also patented a process of preparing a mosaic multicolour screen-plate of any pattern, regular or irregular, the essential part of the invention being that no resist or protecting medium is used in order to obtain the distribution of the colour elements. The distribution of the dves is obtained by a method whereby one set of dved portions (after being dried, and when the whole plate has been immersed in a second different dye solution) does not absorb this second colour, provided that the latter's time of action is short. Nevertheless, even with this short dyeing with the second colour sufficient intensity of this latter may be obtained. Dyes which are named as suitable for the process are crystal violet for the first dyeing, malachite green used for about three seconds, and rhodamine G used for about one second. The dye solutions above mentioned are used in equal alcoholic saturated solution.—Eng. Pat. No. 21,840, 1908; "B.J.," May 28, 1909, p. 426.

Sprayed Resist Screen-Plate.—G. S. Whitfield has patented a method of preparing a multicolour mosaic screen-plate of irregular grain, which consists essentially in spraying on to a plate (which has been stained with a suitable dye) a solution serving to protect the surface of the plate from the action of a solvent, and plate allowing of the dye being washed out from all parts of the plate except those underneath the resist which is thus sprayed on. The

process consists in first dyeing a collodion film (mounted upon glass or celluloid) uniformly all over. The collodion film is then sprayed with a solution of rubber or gutta-percha or wax dissolved in, say, napththa. A series of tiny spots is thus formed over the dyed surface. On washing or bleaching the surface the dye is removed, except under those spots. The whole plate is now dyed a second colour, a second series of spots sprayed on, and the plate again washed out. A third dyeing of the whole plate is now done, and the area of the plate is thus completely filled with colour elements. The two applications of resist spots may be removed with a suitable solvent which does not disturb the three dyes.—Eng. Pat. No. 9,044, 1908; "B.J.," May 28, 1909, p. 425.

Zone-Pattern Colour Screen-Plate.—H. W. H. Palmer has patented a pattern of screen-plate in which the colour elements are distirbuted in concentric circular bands, the method of preparation being by impression from a die or other known means.—Eng. Pat. No. 17,309, 1908; "B.J.," Sept. 3, 1909, p. 689.

Screen-Plate with Compensating Filter.—J. Bamber has patented the use of a coloured substratum, serving as a compensating filter when making exposures. The three colours are applied to this coloured basis by dusting on or other method.—Eng. Pat. 11,147, 1909; "B.J.," Sept. 17, 1909, p. 730.

SCREEN-PLATES ON THE MARKET.

THE LUMIÈRE AUTOCHROME.

Simplified Treatment of Autochrome Plates.—The Lumière N. A. Company, for plates issued subsequent to Apr. 1, 1909, give the following instructions, which involve the use of two baths only, namely:—

mely:—		
1.—Developer, also Re-dev	ELOPER.	
Distilled water	35 ozs.	1000 c.c.s.
Quinomet	60 grs.	4 gms.
Soda sulphite, anhydrous	270 grs.	18 gms.
Ammonia 0.920 (22 deg. Baumé)	100 mns.	6 c.c.s.
Potass. bromide	15 grs.	1 gm.
2.—Reversal.		
Water	80 ozs.	1000 c.c.s.
Potass. permanganate	70 grs.	2 gms.
Sulphuric acid	$6\frac{1}{2}$ drms.	10 c.c.s.

For the first development the solution No. 1, as given above, is used for $2\frac{1}{2}$ mins. at 65° F. in cases of correct exposure. Bath No. 2 is the reversing solution, which is allowed to act for three or four minutes, the plate washed for about half a minute in running water, and then put back into the same batch of developing solution. After three or four minutes, when the high-lights are completely darkened, the plate is washed for three or four minutes,

and, without fixing, set to dry. If after re-development the plate is seen to lack brilliance (due to over-exposure), it may be intensified with the acid-silver formula previously recommended by MM. Lumière.—"B.J." (Colour Supplement), Apr. 2, 1909, p. 26.

Correcting Exposure in Development.—MM. Lumière have given the following directions for correcting errors of exposure when using a one-solution developer. This latter is:—

Metoquinone	15 gms.	130 grs.
Sodium sulphite		2 ozs.
Ammonia (sp. gr. 0.923)	32 c.c.s.	41 drs.
Potass. bromide	6 gms.	54 grs.
Water	1000 c.c.s.	20 ozs.

For a half-plate 5 c.c.s. of this stock solution are mixed with 100 c.c.s. of water, and at 60° F. placed in the developing dish. Measures containing 15 and 45 c.c.s. of the stock solution are placed at hand. The plate is immersed in solution A, and a number of seconds counted until the first outlines of the picture other than the sky appear. The total time of development is then fixed in accordance with the following table:—

Time of Appearance of	Quantity of Developer	Total Time of Develop-	
First Outlines of Image	to Add on Appearance	ment Inclusive of that	
Apart from Sky.	of First Outlines.		
		of First Appearance.	
Secs.	C.c.s.	Min. Secs.	
12 to 14		1 15	
15 to 17		1 45	
18 to 21		2 15	
22 to 27	15	3 0	
00 40 77	15	3 30	
71 40 70	15	4 30	
11 +- 17*	45	3 0	
more than 47*	45	4 6	
* Great under-exposure.			

-"B.J." (Colour Supplement), Sept. 3, 1909, p. 67.

Autochrome Practice.—F. Martin-Duncan, in recording the result of the year's work in the Autochrome process, states that he finds it best to use the Lumière modified first development, reversing with a freshly mixed mixture of acid and permanganate, afterwards placing the plate direct in a bath of sodium bisulphite solution 30 minims, water 2 ozs. The plate is then thoroughly washed, re-developed with amidol, and again well washed. It is then placed in an E solution made twice the strength of that given in the original Lumière instructions. It is always well to intensify, and necessary to have the F solution quite fresh—that is, free from brown colour or floculent matter. If the plate looks at all dense or heavy, a weak Howard Farmer reducer will benefit it.—"B.J." (Colour Supplement), Apr. 2, 1909, p. 25.

Autochromes of Extreme Contrast.—Dr. Drake-Brockman has used with success the Sterry method of giving the plate a preliminary bath of 1 per cent. bichromate solution (applied before the first

development) for about thirty seconds to two minutes when dealing with subjects of very violent contrasts. The solution also allows of the Autochrome plate being developed in an orange light once the bichromate solution has been applied.—"B.J." (Colour Supplement), Oct. 1, 1909, p. 73.

Extra Sensitiveness in the Autochrome Plate.—J. Thovert has advised the use of extra dye baths for Autochrome plates. For exposure by daylight a bath of pinachrome, 1:200,000, is used for two minutes, and the plates rinsed in clean water for one minute. A suitable compensating filter for these extra-sensitive plates is made as follows:—A stock solution is prepared of 1 gm. Filter Yellow K (Hoechst) in 150 c.c.s. of water. 1 c.c. of this solution is added to 9 c.c.s. of 4 per cent. gelatine solution, and the mixture flowed over the glass plate in the proportion of 5 c.c.s. per square decimetre.

For exposures by magnesium flashlight a suitable sensitising bath is erythrosin, 1: 1,000,000, used for two minutes, and the plates briefly rinsed. In making the compensating filter a 1 per cent. solution of Filter Yellow K is prepared, and 1 c.c. added to 20 c.c.s. of 4 per cent. gelatine the mixture being flowed over glass in the same proportion as before, namely, 5 c.c.s. per square decimetre. This formula for the light-filter applies only to the Lumière flash-powder. Other powders require a different filter; for example, the "Agfa" powder requires one of green absorption

Owing to the thinness of the film the bathed plates dry very quickly without heat. The bath is mopped off the back of the plate with a tuft of cotton wool.—"Phot. Couleurs," May, 1909,

p. 95; "B.J." (Colour Supplement), July 2, 1909, p. 53.

A Dry Reversing Mixture.—The Comte de Dalmas, in recommending a dry mixture for the preparation of the Autochrome reversing solution for use on tour, gives the formula:—

Potass. permanganate	2 gms.	18 grs.
Sodium bisulphate	50 gms.	1 oz.
Water	1000 c.c.s.	20 ozs.

The two salts are carried separately in powder and rapidly dissolved to give the reversing bath, the acidity of which is provided by the acid sulphate.—"Bull. Soc. Fr. Phot.," Mar. 1, 1909, p. 102; "B.J." (Colour Supplement), May 7, 1909, p. 40.

Pyro Solution to Keep.—T. K. Grant, in a demonstration before the Croydon Camera Club, gave a formula for the F. pyro solution used in intensifying Autochromes which prevented the fungoid growth which sometimes occurs:—

Pyro	3 gms.	27 grs.
Citric acid	3 gms.	
Salicylic acid (2 per cent. solution)	100 e.c.s.	2 ozs.
Water	900 c.c.s.	18 (Z2.

As a remedy for the small black spots which occurred at times in the Autochrome plate, he used a fairly strong solution of iodine in potass iodide, made by dissolving 15 grains each of potass iodide and iodine in 2 ozs. of water. This liquid is applied cautiously, followed by immersion in the hypo bath.—"B.J.," Nov. 20, 1908, p. 896, and "Colour Photography" Supplement, Dec. 4, 1908, p. 96.

Sulphide Toning for Autochromes.—A. Damry, writing of the sulphide method advised by M. Torchon ("B.J.A.," 1909, p. 656) complains of weak images. To intensify he uses:—

Mercuric iodide		5 gms.	7 grs.
Sodium sulphite	(anhydrous)	1 gm.	15 grs.
Water		15 c.c.s.	d oz.

On stirring up the two solids in the water a colourless solution is obtained. Addition is then made of 50 c.c.s. of water. The plate is immersed in this solution, which is allowed to act until the result is thought to be satisfactory, after which the plate is washed, put back for a moment into the sulphide bath, and lastly given a further short wash.—"Phot. Couleurs," Dec. 1908, p. 301; "B.J." (Colour Supplement), Jan. 1, 1909, p. 5.

Another worker, R. Ceillier, refers to the reddish stain or colour produced by sulphide toning as directed by M. Torchon. He traces the cause to manganese compounds left in the film. To remove this, a bisulphite bath is not sufficient unless preceded and followed by thorough washing. The sulphide bath should be only 1 per cent. solution of ammonium sulphide.—"Phot. Revue,"

Dec. 6, 1908, p. 177.

Reducer for Autochromes.—When reducing, J. Löwy advises the addition of about one-sixth of its bulk of methylated spirit to the Farmer reducer, penetration into the film being prevented.—"Phot. Korr.," Mar. and Apr., 1909, pp. 121 and 159.

Re-developing Autochromes which have Practically Disappeared in the Fixing Bath.—G. Müller recommends the Neuhauss physical intensifier:—

Ammonium sulphocyanide	24 gms.	5 oz.
Silver nitrate	4 gms.	360 grs.
Sodium sulphite	24 gms.	5 ozs.
Hypo	5 gms.	1 oż.
Potass. bromide, 10 per cent. solution	6 drops.	34 drops.
Water	100 c.c.s.	20 ozs.

For use 6 c.c.s. of this solution are diluted with distilled water to 60 c.c.s. and 2 c.c.s. of rodinal added, that is to say, one part of the solution is diluted with 9 parts of distilled water and the rodinal added to the amount of 1-30th of the bulk of the mixture.—"Phot. Rund," Heft. 8, 1909, p. 96; "B.J." (Colour Suplement), May 7, 1909, p. 40.

Autochrome Lantern Slides.—Ernest Marriage considers that in nine cases out of ten Autochromes intended for lantern slides should not be intensified. A brilliant three-foot picture should be obtainable with a blow-through jet, but if the slide is intensified it frequently becomes too opaque to fulfil this condition. In order to compensate for the deficiency of limelight in blue rays, it is useful to use a very pale blue screen in the lantern or to project the slides upon a screen painted pale blue with one of the distempers sold as "sky-blue" or light-blue."—"A.P.," Dec. 15, 1908, p. 565.

Autochrome Safe-Lights.—A. Löwy uses the following safe-light in developing Autochromes by inspection. A glass plate 10×8 inches in size is flowed over with the following solution:—

Neubordeau R, 3: 100	5	c.c.s.
Tartrazine, 4: 100	6	C.C.S.
Lichtgrün S, 5: 100 (1)	7	C.C.S.
Glycerine	2	C.C.S.
Gelatine solution, 1:10	20	c.c.s.

After the coating has set, the plate is put to dry as quickly as possible in a moderately warmed, well-aired room, bound with a glass cover to protect it from damp, using a linen or rubber binding for this purpose. The stock solution of the Neubordeau dye keeps only a few days, that of the other colours will keep for a longer time.

For a filter which is to be used for daylight, a screen is made exactly as directed above, but is bound up when finished with a second screen prepared as follows:—

Viewing Frame.—B. J. Falk has patented a frame for the viewing of Autochrome and other transparencies in which the Autochrome is placed upside down in a frame exposed to light, and its reflection in a mirror then examined by the observer. Eng. Pat. No. 11,354, 1908.—"B.J.," Apr. 30, 1909, p. 348.

[A similar type of frame is that introduced during 1908 by Messrs. Houghtons, Limited, and described and illustrated in "B.J.A.," 1909, p. 753.—ED.]

Dimensions of the Autochrome Film.—E. Senior has cut sections of the film of the Autochrome plate by embedding the latter in paraffin, and mounting the sections in balsam for examination.

¹ All three dyes in the above formula are those of the Badische Anilin und Soda Fabrik, Ludwigshafen a/Rh.

This method gave him the following figures from a number carefully ascertained by various methods:—

Thickness of the combined films, 0.09 to 0.10 mm. (about 1.250 in.)

Thickness of the layer of varnish fixing

the starch grains to the glass = 0.05 mm. Thickness of the layer of starch itself... = 0.02 mm.

Thickness of the varnish separating the

starch from the emulsion = 0.01 mm. Thickness of the emulsion itself = 0.02 mm.

Total..... 0·10 mm.

The emulsion appears to be a gelatine one of rather a fine grain, the particles measuring about 0.0014 mm. in diameter.—"Phot.," June 8, 1909, p. 464.

Permanency of Autochromes.—Tests made by J. Löwy, of the Autochrome showed that after exposure equivalent to seven days' complete sunshine only slight reduction of intensity took place, the plate becoming a little redder. A transparency kept for six months in a well-lighted room showed no difference between one part

exposed and the other covered with black paper.

Heat tests of the Autochrome showed that repeated heating to a temperature of 160° F., if of short duration (one minute) will do no harm. Longer exposure causes darkening of the image. The 5 per cent. glycerine bath, recommended by Hübl, as a preventive of cracking of the Autochrome film on exposure to heat, was found by Herr Löwy to be effective even when plates were heated for one hour to a temperature of 212°.—"Phot. Korr.," Mar. and Apr., 1909, pp. 121 and 159; "B.J." (Colour Supplement), May 7, 1909, p. 37.

The Autochrome Light Filter.—An editorial note records that the light-filter employed for the Autochrome plates was found to have become perceptibly paler in colour owing to having been left about in the light for a year or more, the results obtained with this filter having a bluish-violet tinge over them.—"Phot.," July 6, 1909, p. 9.

Compensation Filters for Autochrome Plates.—Baron von Hübl, in giving the following formulæ for making these light-filters, points out that it is necessary to check their correctness by photographing a grey scale. If the scale comes out too blue or yellowish, the proportion of the yellow dye must be raised or reduced, whilst if the reproduction is reddish or greyish the red constituent of the filter should be corrected. As, nowever, both of these defects are liable to occur at once, the correct adjustment of such filters is frequently a task of considerable difficulty and calls for the expenditure of a good deal of time and a number of Autochrome plates.

Von Hübl gives the following formula for making a light-filter corresponding in its action with that made by MM. Lumière:

A.—Tartrazine, pure (Hoechst)	1 gm.
Water	500 c.c.s.
B.—Phenosaffranine, pure (Hoechst)	0·1 gm.
Water	700 c.c.s.
C.—Gelatine	
Water	90 0 08

40 c.c.s. of the gelatine solution are mixed with 10 c.c.s. each of A and B. Immediately before use 0.4 gm. of æsculin, dissolved in 20 c.c.s. of water, with addition of 3 drops of ammonia, is added to

the C solution of gelatine.

The ammonia colution of asculin speedily becomes brown, owing to exidation by the air, and, therefore, should be freshly mixed at each time of use, in order to avoid disturbing the action of the filter. Thin pieces of parallel plate-glass of about 1 mm. thickness are coated with the above mixture, using 8 c.c.s. of solution per square decimetre surface. The making of a correct filter requires very careful preparation of the gelatine dye solution and exact measurements of the liquid coated on the glass. 1 c.c. per square decimetre, more or less, has a distinct influence on the reproduction of a neutral scale.

If the proportion of gelatine dye solution be reduced to 7 c.c.s. per square décimetre, the shadows will become distinctly blue.

By using 13 instead of 10 c.c.s. of the B. solution, the results

are of a warmer tint.

When photographing whitish tones against very dark colours a more intense filter (9 c.c.s. of the coloured gelatine solution per square décimetre) gives an improved result.

FILTER FOR USE WITH ARC LIGHT.

When working by arc light there should be less red dye in the filter. A suitable formula is:

Gelatine solution, 1	: 15	40 c.c.s.
	1 : 500	
	1:7,000	1 c.c.
	in 35 c.c.s. water, with	
addition of 3	drops ammonia	0.4 gm.

8 c.c.s. of this solution are used for each square décimetre surface. This filter used in photographing a grey scale illuminated by a 25-ampère arc lamp gives a neutral reproduction. It must be remarked, however, that the colour of the light is dependent to a considerable extent on the state of the carbons and on the size and mounting of the lamp; also on the voltage; and thus a filter which can be relied upon to give constant compensation when making Autochrome exposures by arc light cannot be made.

FILTER FOR USE WITH NERNST LIGHT.

When using the Nernst or incandescent gaslight a pale greenishyellow filter is needed, and is best prepared by combining a yellow screen with one of pale blue. The screens being weak in colour, it is best to make a 1:2,500 solution of tartrazine by mixing 10 c.c.s. of the 1:500 solution with 40 c.c.s. of water. The filter for the Nernst light is :-

Yellow Screen:	
Gelatine solution, 1:15	40 c.c.s.
Tartrazine solution, 1: 2,500	3 c.c.s.
Æsculin, dissolved in 37 c.c.s. of water, with	
addition of 3 drops ammonia	0.1 gm.

8 c.c.s. of this solution are used per square décimetre surface. This forms a yellow screen. A blue screen is made as follows :-

Blue Screen :-

Gelatine solution, 1:15	40 c.c.s.
Patent blue solution, 1: 1,000 (Hoechst)	2 c.c.s.
Water	38 c.c.s.

7 c.c.s. of this solution are used for each square décimetre of glass. The two screens are bound together as described below.

FILTER FOR INCANDESCENT GASLIGHT.

The yellow screen is that given above for the Nernst light. The blue screen is a little paler; the above "patent blue" gelatine solution is used to the amount of 5 c.c.s. per square décimetre. These yellow and blue screens are cut to the size required when dry, are cemented with Canada balsam, and bound with lantern binding. It is also necessary in the case of the Nernst and incandescent light to bear in mind that the colour is liable to vary as the lamps are kept in use. Used lamps emit a decidedly reddish light, and require filters differing from those which are correct for filaments or mantles freshly taken into use.—"Phot. Rund.," Heft 1, p. 1; Heft 2, p. 17, 1909; "B.J." (Colour Supplement), Feb. 5, p. 14, and Mar. 5, p. 17, 1909.

Viewing Filters for Autochromes.-Baron von Hübl has given formulæ for the making of compensating filters to be used when viewing Autochromes by various artificial lights, or when using arc light for the projection. A flat glass plate is coated with a dyed gelatine solution, the stock solutions required being (a) gelatine solution, 1 in 15; (b) patent blue solution, 1 in 1,000; (c) rose Bengal, 1 in 100.

(1) Viewing filter for petroleum or gas light and electric light: 40 c.c. of (a), 5 c.c. of (b), 3 c.c. of (c), 30 c.c. of water.

(2) For incandescent gaslight: 40 c.c. of (a), 3 c.c. of (b), 5 c.c.

of (c), 30 c.c. of water.

(3) For electric arc light: 40 c.c. of (a), 4 c.c. of (b), 4 c.c. of (c), 30 c.c. of water. In every case coat 5 to 6 c.c. of dyed gelatine

solution per square décimetre.

When projecting Autochrome pictures it is advisable to use a filter which has been dyed with solution No. 3, but which is even a little lighter. The colours will thereby be more correctly reproduced; they lose the reddish tinge: green-blue and yellow are better separated, and the loss of light is not too apparent. It is also noteworthy that the delicate yellow tones are not destroyed by the use of the blue filter, but on the contrary appear much more distinct. The yellows disappear into the white ground with yellow illumination, but if this light is made white by the blue filter the yellow is better recognisable. It is not advisable to coat the slides with the blue film, as they easily produce a bluish tinge, which is not the case when the blue filter is placed before or behind the condenser. If we chance to look at the illuminated screen (upon which the slides are being projected), say perhaps when the pictures are being changed, it looks as if it were illuminated with white light, and the slide which follows appears bluish in the colourless parts, although, as a matter of fact, this is white and the sheet was yellowish before. This is not the case if the light of the lamp remains corrected by the blue filter, because then its vellow light cannot lead us astray.

In the place of the filter a bluish projecting screen could be used, but the loss of light would be the same, as it is a matter of indifference whether the superfluous red and green rays are absorbed

in the lantern or by a pigment on the screen.

Blue filter No. 3 should be used if it is desired to prepare by electric arc light the colour-sensation negatives for three-colour reproduction of an Autochrome, because the reddish lighting lends the whole picture a general tinge which would be evident in the reproduction. If, however, a blue screen is placed in front of the original it appears illuminated by white light, and the resulting three-colour negatives are then exactly the same as those obtained by daylight.—"Wien Mitt.," Feb., 1909, p. 49; "B.J." (Colour Supplement), Apr. 2, 1909, p. 26.

Autochromes by Enclosed-Arc Light.—It has been found that the colour rendering of Autochromes, illuminated by enclosed arc when using the Lumière filter, is unsatisfactory. This is possibly due to the filter not absorbing all the ultra-violet rays in which these lamps are so rich. A filter that will give good results, however, can be made from a solution of bichromate of potash in water. This must be very dilute, from 1-15th to 1-20th of 1 per cent., according to the width of the filter cell, 1-20th per cent. serving for a cell one centimetre in width.—"B.J.," Jan. 29, 1909, p. 86.

Autochrome Portraits by Flashlight.—F. Monpillard gives the following formulæ for a light-filter to be used when exposing the Autochrome plate by the "Ideal" flash powder of M. D'Osmond. The dyes employed are quinoline-yellow, extra (made by the Badische Anilin and Soda Fabrik), Hoechst "patent-blue," and esculine. The following stock solutions are first prepared:—

A.	Quinoline yellow	0.5 gm.
	Water, distilled	100 c.c.s.
В.	"Patent-blue," Hoechst	0.1 gm.
	Water, distilled	100 c.c.s.

In 5 to 6 c.c.s. of warm distilled water, contained in a graduated measure of 25 c.c.s. capacity, 0.05 gm. of asculine is dissolved; 1.3

c.c.s. of solution A, 0.6 c.c. of solution B, and 12 to 13 c.c.s. of 10 per cent. gelatine solution containing glycerine in the proportion of 2 gms. per 100 gms. of gelatine are added, and the whole volume made up to 25 c.c.s. This warm solution is filtered and flowed on to glass in the proportion of 5 c.c.s. of the mixture per 100 square cm. surface. It is dried away from dust, and the film protected by cementing a second glass to the first with Canada balsam.

Each square cm. of this screen thus contains :-

Quinoline-yellow	0.000013 gm.
"Patent-blue," Hoechst	0.0000012 gm.
Æsculine	0.0001 gm.

The screen thus prepared is placed either before or behind the lens; in all cases it is best to focus with the screen in position, taking the usual precautions necessary when using the Autochrome

With a lens of f/4.3 aperture and a full-length subject placed about 10 ft. from the camera, 8 to 10 gms. of the powder will suffice for an exposure. The powder should be laid in a train 15 to 20 ins. long, and placed behind a muslin screen, the latter being about 6 to 7 ft. from the sitter. A little diffused daylight in the room is an advantage, as the sitter does not then feel the shock of the brilliant flash.—"Bull. Soc. Fr. Phot.," May 15, 1909, p. 203; "B.J." (Colour Supplement), July 2, 1909, p. 51.

H. D'Osmond gives some practical hints on the use of the Autochrome by the "Ideal" flashlight, using the above filter. About 8 to 10 gms. of powder were used about 6 ft. from the subject, placing a diffusing screen of muslin about 18 ins. in front of the light. A lens working at f/3.8 was employed.

A vigorous developer being necessary, the following solution was made up :-

Metoquinone	15 gms.	130 grs.
Sodium sulphite, anhydrous	100 gms.	2 ozs.
Ammonia 22 deg. (0.923)	32 c.c.s.	41 drs.
Potass. bromide	6 gms.	54 grs
Water		20 ozs.

and diluted for use with four parts of water .- "Photo-Gazette," June, 1909, p. 141; "B.J." (Colour Supplement), Aug. 6, 1909. p. 60.

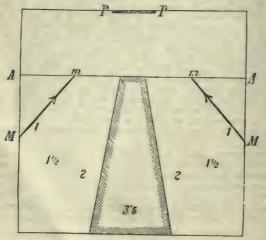
Photomicrography by Limelight on the Autochrome Plate.—M. Monpillard gives the following formula for a compensating filter to be used when using limelight as the illuminant in photo-micro work on the Autochrome plate :-

STOCK SOLUTIONS. A. Quinoline yellow 0.5 gm. 44 grs. Water, distilled 100 c.c.s. 20 ozs. B. Brilliant acid green 6 B 0.1 gm. 1 gr. Water, distilled 1000 c.c.s. 20 ozs.

In 5 to 6 c.c.s. of distilled water placed in a 25 c.c. bottle there is first dissolved 0.05 gm. of asculine, 0.5 c.c. of solution A is then

added, 1 c.c. of solution B, and then 12 to 13 c.c.s. of 10 per cent. gelatine solution in glycerine. The volume is made up to 25 c.c.s. with distilled water, filtered hot, and flowed upon the glasses in the proportion 5 c.c.s. of the mixture per 100 sq. cm.—"Bull. Soc. Fr. Phot.," June 15, 1909, p. 245; "B.J." (Colour Supplement), Aug. 6, 1909, p. 61.

Metallic Lantern-Screen for Autochrome and Other Projections.—Dr. H. Lehmann has described the forms of metal-coated projection-screens by means of which much greater brightness is obtained, although at the cost of the angle within which the picture is visible in its full brightness to the observer. Since the use of a metal screen by Anderton in 1891 several forms of screen have become available. A method of preparation is to apply metallic powder in the form of very thin leaves or plates to a surface coated with an adhesive preparation. Still better results are obtained with an aluminium screen made by Zeiss with a peculiarly



rippled surface. This gives an image which is about three and a half times brighter than that projected in the ordinary way, whilst another screen of matt-aluminium, also made by Zeiss, gives an image of twelve times brightness. In order that such screens may be used for a fair number of people they must be placed at a considerable distance from the audience, which must be arranged in a long narrow block immediately facing the screen.—"Phot. Chron.," May 16, p. 245, and May 23, p. 257, 1909; "B.J." (Colour Supplement), June 4, 1909, p. 44.

Baron von Hübl has drawn the following diagram, corresponding with the Zeiss rippled screen of three and a half times bril-

liancy, showing that under ordinary conditions of lantern projection, in which P P is the screen and A A the first row of spectators, only those (20 per cent.) within the hatched area will see the picture at its full brilliancy; the brightness observable on each side falls off to 2, 1½, and 1 at the outside limit m M.—"Wien. Mitt.," May, 1909, p. 201; "B.J." (Colour Supplement), June 4, 1909, p. 47.

THE "OMNICOLOBE" PLATE.

The "Omnicolore" Screen-Plate.-Dr. C. E. K. Mees, as the result of examining one of the early examples of this screen-plate made by M. Jougla and Co., 45, Rue de Rivoli, Paris, has found that the bands forming the blue lines of the screen are approximately 1-400th of an anch in width, the red squares being 1-300th of an inch across. As regards transmission of light the filters differ widely from those of the Autochrome, which transmit narrow bands. The red filter in the "Omnicolore" cuts off sharply at 5,800, but it transmits ultra-violet and violet light. The green filter does not at all remove the red, only subduing it. It has, however, a strong absorption for the blue, transmitting to some extent the extreme violet. The blue filter has a very gradual absorption, subduing the green and red from about 5,100 upwards. The emulsion in the "Omnicolore" appears to be of gelatine, and though of lower sensitiveness than that on the Autochrome or "Thames" plate, allows of shorter exposures in the camera than the Autochrome, owing to the more open character of the screen. The emulsion adheres perfectly to the screen without sign of frilling .- "B.J." (Colour Supplement), Feb. 5, 1909, p. 9.

Dr. W. Scheffer, as the result of photo-micrographs taken of the "Omnicolore" screen, has found that the method of preparing the screen is as follows :- The blue-coloured bands are first applied, and then, at right-angles to them, the green bands. These latter adhere only where they come in contact with the substratum, since the blue ink repels the green. The red elements are obtained by giving the plate a bath of the red dye. The characteristic yellow colour under the green areas thus points to the fact that the green dye is a mixture, part of the yellow in which has diffused into the substratum.—"B.J." (Colour Supplement), Feb. 5, 1909, p. 11.

A description and account of experiments with the "Omnicolore" plate are given by K. W. Wolff-Czapek, in "Phot. Indus.," Jan. 20, 1909, p. 59.

Working instructions for the "Omnicolore" plate and photomicrographs of the screen, as compared with the "Thames" and the Autochrome, are given in "Phot.," Jan. 26, 1909, p. 73.

The solutions required for the "Omnicolore" plate are as

follows :-

DEVELOPER AND RE-DEVELOPER.

A.	Metol	4 gms.	35 grs.
	Sodium sulphite (anhydrous)	50 gms.	1 oz.
	Hydroquinone	2 gms.	18 grs.
	Potass. carbonate (dry)	30 gms.	260 grs.

Potass. bromide	1 gm.	9 grs.
Hypo solution (1 per cent.)	15 c.c.s.	130 minims
Water	1000 c.c.s.	20 ozs.

REVERSING SOLUTION.

B. Potassium or sodium bichromate		70 grs.
Sulphuric acid		105 minims
Distilled water	1000 c.c.s.	20 ozs.

This bath is best used in white light (daylight if possible). The dish should be rocked while the bath is acting, the silver of the negative image being completely removed in about two minutes.

FIXING BATH.

Hypo		120 gms.	24 ozs.
Sodium	metabisulphite	30 gms.	260 grs.
Water		1000 c.c.s.	

Fixing should not take longer than three to four minutes.

Too little washing after reversal greatly retards the second development, and may give rise to a yellow stain in the plate. It is therefore better to place the plate for about one minute in the following solution before transferring to the re-developer:-

Sodium bisulphite solution	50 c.c.s.	1 oz.
or Potassium metabisulphite	50 gms.	l oz.
Water	1000 c.c.s.	20 ozs.

The plate is washed for a second or two after the use of this bath. The following bath may be used as a means simply of clearing a plate which is slightly veiled or grey :-

Bichromate solution B	12 c.c.g.	105 minims
Distilled water	1000 c.c.s.	20 ozs.

This is used after the plate has been washed, following the use of the re-developer. The plate should, of course, be well washed again before fixing.—"B.J." (Colour Supplement), Feb. 5, 1909, p. 13.

It is found that the use of the acid sulphite bath immediately following reversal is a very essential part of the process, otherwise there is some difficulty in getting the plate to re-develop. The violet dye in the plate appears not to be completely protected from the action of the solution, so that the colours fall off a little during re-development and fixing. The latter process, however, is necessary to obtain bright colours throughout. It would seem that more efficient protection of the screen-plate is needed.—"B.J." (Colour Supplement), June 4, 1909, p. 42.

THE "THAMES" PLATE.

The "Thames" Plate.-H. E. Corke describes his first trials of this plate, made by the Thames Colour Plate Company, 254a, High Holborn, London, W.C.—"B.J.," Nov. 20, 1908, p. 884.

The formulæ given (September, 1909) for treating the plate are

as follows, the same solutions being used for both the "separate"

plate and screen and the "combined" plate (i.e., emulsion-coated screen-plate):—

DEVELOPER AND RE-DEVELOPER.

A.	Hydroquinone	d oz.	25 gms.
	Potass. metabisulphite	½ oz.	25 gms.
	Potass. bromide		6.8 gms.
	Water	20 ozs.	1000 c.c.s.
B.	Caustic potash	1 oz.	50 gms.
	Water	20 ozs.	1000 c.c.s.

Use equal parts of A and B.

REVERSING SOLUTION.

Potass. bichromate	1 oz.	100 gms.
Water	10 ozs.	1000 c.c.s.
Sulphuric acid	1 dr.	12 c.c.s.

This is used repeatedly.

The fixing bath consists of a 1 in 5 solution of hypo.

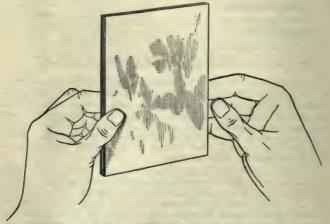
Registering the "Thames" Screen-Plate with its Positive Transparency.—Colin N. Bennett describes as follows the "trick" of rapidly bringing the filter screen-plate into correct register with the positive transparency. First, lay the plates film to film, and shift the two one on the other, so as to eliminate all pattern effects or unevenness of colour over large areas of a like tint. Never mind for the moment what colours actually show themselves so long as the pattern effect is gone.

Hold them up to the light at arm's length, sitting on a chair the while. (This is a precaution against over-tiredness, which affects the eyesight quicker than any other part of the body.) We shall see, in the case of a Thames screen, a plaid effect in which the plaid can be made to expand or contract by slightly rotating the one glass on the other. Rotate till the plaid expands right off the positive at either corner. At this point one of two effects must be produced. Either you will get a bar effect or there will be a more or less flat effect of colour.

If it is the bar that comes, it means one has mixed up the screens and positives, and are trying to register results with screens other than those with which the monochrome was produced. In the case of duplication this will, of course, be so. It is got over in lantern slides by rotating the colour screen one-quarter (not half) of a turn. This done, or most likely without the necessity for it at all, the plaid will be found on shifting to give place to a flat, almost colourless look. If there are still slight differences, clip one end of the screen and positive with a bulldog clip, and gently press the other in the manner presently to be described until sameness of tint in the background is obtained.

Now take the colour positive, in rough register with a screen as described, in both hands, and hold again directly before the eyes. Let the thumbs press on the colour screen (which should be on the near side) and the fingers on the positive, which should be on the far side of the observer. Remove bulldog clips and proceed as follows:—In all the following part of the operation of registering no conscious slip of positive against screen is to be allowed. We are about to complete registration by relying on the elasticity of the glass alone. If there is a "slip" the process will have to be gone over again from the beginning.

Nip firmly the two glasses with both hands. At the same time turn the two together slowly at an angle with the eye, first sideways, then up and down until suddenly a point of view will be reached in which, say, yellow flowers and blue background will



Illustrating the moment of recovery after imposing the strain on the superposed glasses with both hands together in process of obtaining register.

appear to start out in their natural colours. The effect is one of parallax, and by it we must judge which way to send the shift of screen and plate. If we see the effect we want when the right edge of the tightly pressed positive and colour screen is drawn towards us, it means the screen must be shifted to the left. The same rule applies all round.

Make the shift in the following way:—Put a forward pressure on the right thumb, and at the same time a backward pressure on the left one, at the same time reproducing the two pressures in contrary motion with the fingers, and all the while nipping the two glasses so tightly together that no conscious "slip" is perceptible. The effect is to strain the glasses and bring about a microscopic shift due to their elasticity. It may take a dozen or

more such shifts to move their respective positions the width of one screen dot (approximately 1-1,500 inch). After each application of the shift, remove one hand at a time (see accompanying illustration), relaxing it and retaking hold of the glasses firmly. This will complete the cycle upon which the movement depends, and will make all ready to repeat and repeat until the true colours show up on a square view through the adjusted transparency.

Finally, clip all round with bulldog clips and bind tight with

Finally, clip all round with buildog clips and bind tight with binding strips. Once dry, these show no tendency to warp or pull the combination out of register.—"B.J." (Colour Supplement).

Aug. 6, 1909, p. 57.

"AURORA" SCREEN-PLATE.

"Aurora" Screen-Plate.—This screen-plate, designed and made by E. Fenske, 21, The Pavement, Thornton Heath, London, S.W., is prepared by dusting coloured particles on to an adhesive support. The screen thus prepared is used in conjunction with a separate panchromatic plate.—"B.J." (Colour Supplement), Mar. 5, 1909,

p. 23.

E. Fenske states that the following process is suitable for the reversal of gelatine panchromatic plates as necessary in preparing positives on exposure through a screen-plate:—The negative, after bleaching in a mixture of potass. ferricyanide and ammonium bromide, does not re-develop in hydroquinone (ordinary developing formula). Thus a plate is developed with almost any developer, bleached, and re-developed as a positive with hydroquinone. The plate must during bleaching be exposed to a ruby light, but on no account to white light. When completely bleached, it is washed for a minute and immersed in the hydroquinone developer, being kept close to the ruby light during re-development. After fixing in strong hypo, any veil is removed with Farmer's reducer.—
"B.J." (Colour Supplement), Apr. 2, 1909, p. 32.

Colour Screen-Plates Compared.—R. C. B. (R. Child Bayley), in an article on the three colour plates, the Autochrome, "Thames," and "Omnicolore," describes the "Omnicolore" as having a more transparent filter-film than the Autochrome, due to the less depth of dye and to the absence of black spots or lines where, in the Autochrome, minute particles of starch overlap or where the cell walls are seen edgeways.

As regards colour, the "Thames" plates had generally a blue colour, varying according to the angle at which they were held to the incident light. In the case of the "Omnicolore," the screen is of a salmon tint, also varying according to the angle. The Autochrome is much more nearly neutral, being a nondescript kind of olive in appearance, and in fineness of colour grain is also far

before the other two plates.

In sensitiveness the "Omnicolore" and the "Thames" seem to

be each about twice as fast as the Autochrome.

In correctness of colour rendering the Autochrome is undoubtedly the superior of the other two plates.—"Phot.," Jan. 26, 1909, p. 64.

COPIES OF SCREEN-PLATE TRANSPARENCIES.

Copying Screen-Plate Transparencies.—An English patent (No. 28,614, 1907) of Arthur Schwarz relates to the making of screen-plate duplicates by the Krayn process.—"B.J.," Nov. 13, 1908, p. 874.

Copies of Screen-Plates.—E. B. Wedmore has found that in making contact copies, film to film, with screen-plate negatives, a process such as pinatype, involving the transfer of dye from a gelatine print-plate to a gelatine-coated paper, secures sufficient continuity of tone; the diffusion of the dye produces this result

unless the structure of the colour negative be very coarse.

When making enlargements the use of a heavily coated paper is desirable to assist the diffusion. Diffusion may be increased by heating the print whilst moist, also by retarding the drying. It will be found that each grain in the colour negative is represented in the positive transparency by a spot the size of which depends upon the diameter of stop used, but the centre of which is materially darker than the surroundings. By the use of a large enough stop the dark centres of adjacent spots may be made to blend, but in so doing there is some loss of definition. Improved definition is obtained by the use of a diaphragm, screened so as to cut off some of the light at the centre; thus a stop having a star-shaped obstruction may be employed, or a graduated stop darkest in the centre may be prepared photographically. Such means are not required except when the grain is too large to be conveniently dealt with by diffusion in printing.—Eng. Pat., No. 21,684, 1907; "B.J., Oct. 16, 1908, p. 797.

Paper Colour Prints from Screen-Plate Transparencies .- E. C. G. Caille proposes a process of preparing prints in natural colours as the result of making an exposure on a panchromatic plate through a mosaic three-colour screen-plate of geometrical pattern. From the screen-negative made in this way through a mosaic filter a transparency is made by contact. A print is taken from this on a special surface prepared as follows: -A rigid paper support is impressed with a three-colour pattern identical with that used as a filter in taking the original negative, the colour elements, however, consisting of the complementaries, namely, pink, yellow, and blue. This paper support bearing the three-colour pattern is coated with sensitive gelatino-bromide emulsion. It is laid in registration with the positive made from the original negative and the image developed and fixed. As a result the transparent portions allow of the colours on the screen below being seen and producing the natural colours photographed in the first instance. Owing, however, to the degradation caused by the black deposit of silver which is used to obstruct the colours not forming part of the picture, the author proposes to adopt the so-called "gouache" method of painting, namely, to bleach the black deposit and so obtain dilution of the colours with white instead of degradation with black. In order to secure a bleached image which will not afterwards darken in

the light, the author uses a 1 to 2½ per cent. of bichloride of mercury, draining or blotting off the excess without washing. The excess of bichloride prevents the image from becoming brown in the light. Bichloride of copper in dilute solution may be used for the same purpose, afterwards thoroughly washing and impregnating the print with a weak mercuric chloride solution to prevent after darkening.—Eng. Pat., No. 15,050, 1908; "B.J.," Aug. 13, 1909, p. 634.

The Bleach-Out Process.

Sensitisers and De-sensitisers for Bleach-out Dyes.—Dr. J. H. Smith has examined a number of bodies (desensitisers) which do not aid the bleaching-out of dyes for "Uto" paper, but, on the other hand, reduce the speed of bleaching of one or more dyes or counteract the action of sensitisers, in both cases frequently to an erormous extent. Volatile oils fall into one or other of these classes. Using basic dyes contained in nitro-cellulose, the presence of a diffusing body, such as glycerine or castor oil, is necessary in order to bring out the action of the sensitisers. A sensitiser, which is also a solvent of the collection film, will exert its action, but otherwise will not accelerate the bleaching of the basic dyes. The best sensitiser is anothol.

Other important sensitisers are the oils of:

 Cassia
 Citronella
 Sage

 Cedar leaves
 Mustard
 Spike

 Cedro
 Peppermint
 Spruce

 Cinnamon
 Pine

The following oils were strong desensitisers:—

Caraway oil Oil of origanum Clove oil

It is frequently found that small proportions of a powerful desensitiser will destroy the sensitising action of a moderate sensitiser. Among chemical compounds eugenol and isoeugenol are the most energetic desensitisers, then follow carvacrol and thymol.

Bodies of the aldehyde class usually yield strong sensitisers.

As almost all sensitisers are volatile, it appears necessary to pack manufactured bleach-out paper in tinfoil, and also by covering the surface of the paper with a gelatine coating to imprison the sensitisers until the print has been made, the gelatine film being then stripped off before fixing and finishing the colour copies.—"B.J." (Colour Supplement), Nov. 6, 1908, p. 81.

Dyes for the Bleach-out Process.—Dr. W. Merckens, in a paper appearing in the "Revue Technique et Industrielle," states that from experiments on dyes and colloid bodies it appears that dyes of acid character, or containing acid radicles in their constitution, possess an affinity for gelatine and albumen. Among these are

erythrosin, diamine blue 6G, and naphthol-yellow. Dyes of a basic character more easily impregnate cellulose and its derivatives. Among these are saffranine, methylene-blue, and auramine. The simplest method of preparing a bleach-out paper is to employ three dyes of acid character in gelatine on collodionised paper, or three basic dyes in collodion on a gelatine or baryta-coated paper. The drawback to saffranine for the red colour is that it leaves a brownish residue of colour, but later experiments of the author have led to a suitable dye.—"Phot. Couleurs," Nov., 1908, p. 269; "B.J." (Colour Supplement), Jan. 1, 1909, p. 1.

Bleach-out Process.—Dr. J. H. Smith states that he has discovered a new sensitiser for bleach-out dyes giving enormously greater sensitiveness than anethol. A paper prepared with it should be double the speed of P.O.P.—"B.J." (Colour Supplement), Mar. 5, 1909, p. 23.

Chemistry of the Bleach-out Process.—Dr. K. Gephard has found that in the bleaching-out of mixtures of dyes the action of sensitisers varies with:—

1. The nature of the dye to which they are added.

2. The presence of other dyes or salts.

3. The medium or substratum in which they are dissolved.

4. The relation of their concentration.

Various sugars accelerate, whilst gums retard. Albumenoid substances accelerate, whilst bodies of alkaloid or aldehyde constitution act as retarders. An important point in the bleach-out process is that, in order to ensure the fixation of the image, the decomposition product of the dye should be removed as well as the sensitiser.—"B.J." (Colour Supplement), Apr. 2, 1909, p. 32.

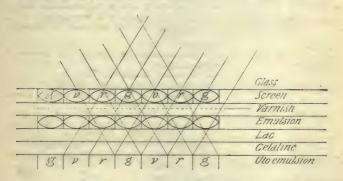
Bleach-out Colour Photographs.—According to a recent German patent (No. 209,993, of Sept. 20, 1907), taken out by Dr. H. Stobbe, of Leipsic, it has been possible to prepare a series of dyes, the so-called fulgides, which are converted most rapidly into colourless compounds on exposure to light. This change takes place with greater rapidity when the fulgides are dissolved in ether, acetone, petroleum-ether, chloroform, benzole, gelatine or acetone-collodion, or when they are supported in a collodion or celloidine film on paper or other cellulose body. Addition of iodine, nitro-benzole, phenol-ethers, or ethereal oils hasten the process to such an extent that the bleaching-out action is complete in a few seconds. The fulgides can therefore be mixed with equally sensitive blue dye for the preparation of multi-colour prints by the bleach-out methods.

Printing Frame for Bleach-out Copies from Autochromes.—Dr. J. H. Smith has worked out the data necessary when using the mirror printing frame suggested by him for accelerating the printing of Autochromes on bleach-out paper, namely:—

(1) The best angle in which to place the mirrors.
(2) The correct length of the mirrors.

Taking the dimensions of the Autochrome plate (in section) as follows: thickness of filter screen, 1-100 mm.; varnish, 1-100 mm.; emulsion, 1-100 mm.; protective varnish, 1-100 mm., and assuming the "Uto" paper to have a gelatine coating of 1-100 mm. and, further, that the average diameter of the coloured patches is 2-100 mm., it can be shown that the mirrors placed round the Autochrome transparency should include an angle not greater than 75°, which angle, for all four mirrors, is calculated to give an increase of light of nearly $4\frac{1}{2}$ times, thus greatly reducing the time of printing.

The other difficulties in the printing of Autochromes arise from the heating of the Autochrome during printing and from the



necessity of keeping the plane of the Autochrome at right angles to the sun's rays. As regards the first, a varnish of gun-cotton in amyl-acetate is used in place of the resinous varnish, and the printing frame is also provided with a fine water spray, which keeps the surface of the Autochrome cool during printing. A metallic frame is cemented round the plate to keep the water from penetrating into the interior of the frame.

In order to keep the frame at right angles to the sun's rays during printing, a sheet of metal is introduced upon which the contours of the shadow of one of the mirrors when in proper position is indicated.—"B.J." (Colour Supplement), Jan. 1, 1909, p. 2.

The apparatus is patented by J. H. Smith and W. Merckens in Eng. Pat. No. 15,937, 1907.—"B.J.," Aug. 27 1909, p. 676.

Trichromy by the Bleach-out Method.—H. Quentin suggests that makers of bleach-out papers should supply three separate papers, each giving a different colour, and prepared so that the three images could be combined by stripping.—"Phot. Couleurs," July, 1909, p. 153; "B.J." (Colour Supplement), Oct. 1, 1909, p. 78.

KEY TO THE ABBREVIATIONS OF JOURN	ALS QUOTED	IN "EPITOME
of Progress," with Addresses	OF THOSE	PUBLISHED IN
Foreign Countries:—		

Foreign Countrie	ES :
"A. P."	"The Amateur Photographer and Photographic News."
"Amer. Phot."	"American Photography." 361, Broadway, New York City, U.S.A.
"Ann. Gen. Phot."	"Annuaire Général de la Photographie." Plon-Nourritt & Co., 8, Rue Garancière, Paris.
"Ann. Chem. Phys."	"Annales de Chimie et de Physique." Masson et Cie., 120, Boulevard St. Germain, Paris.
"Apollo"	"Apollo." Albrechtstrasse 39b, Dresden A 10, Germany.
"Atelier"	"Das Atelier." W. Knapp, Halle a/Saale, Germany.
"Aust. Phot. Journ."	"Australian Photographic Journal." Harrington & Co., Ltd., 386, George Street, Sydney, Australia.
"Aust. Phot. Rev."	"Australian Photographic Review." Baker & Rouse Proprietary, Ltd., 375, George Street, Sydney, Australia.
"B.J."	"The British Journal of Photography."
"B.J.A."	"The British Journal Photographic Al- manac."
"Photo-Notes."	"Photo-Notes."
"Berichte"	"Berichte der Deutschen Chemischen Ge- sellschaft."
"Bild"	R. Friedländer & Sohn, Karlstr. 11, Berlin. "Das Bild."
	Neue Photographische Gesellschaft, Steglitz, Berlin.
"Bull. Belge"	"Bulletin de l'Association Belge de Photo- graphie."
"T I T CI C "	Ch. Puttemans, Palais du Midi, Brussels.
"Bull. Fr. Chem. Sec."	"Bulletin of the French Chemical Society." Masson et Cie., 120, Boulevard St. Germain, Paris.
"Bull, Soc. Fr. Phot."	"Bulletin de la Société Française de Photo- graphie."
	Gautier-Villars et Fils, Quai des Grands- Augustins 55, Paris, France.
"Bull. Phot."	"Bulletin of Photography." 506, Washington Building, Chestnut Street, Philadelphia, U.S.A.
" Cam."	"The Camera.'

506, Washington Building, Chestnut Street, Philadelphia, U.S.A.

1310] AND THOTO	What had a material Continuous
"Cam. Craft"	"Camera Craft." 713/715, Call Building, San Francisco, Cal., U.S.A.
"Cam. Work"	"Camera Work." Alfred Stieglitz, 1111, Madison Avenue, New York, U.S.A.
"Cent. Zeit."	"Central Zeitung für Optik und Mechanik." 7, Bülowstr., Berlin, W., Germany.
"Chem. News"	"The Chemical News."
"Chem. Zeit."	"Chemiker Zeitung.". Dr. G. Krause, Cöthen (Anhalt), Germany.
"Compt. Rend."	"Comptes-Rendus des Séances de l'Acadé-
	mie des Sciences."
	Gautier-Villars, 55, Quai des Grands-Augus- tins, Paris.
"D. Phot. Zeit."	"Deutsche Photographen-Zeitung." K. Schwier, Weimar, Germany.
"Der Amateur"	"Der Amateur."
"Der Phot."	Mondscheingasse 6, Vienna VII, Austria. "Der Photograph."
"Der Fhoi	Benno Fernbach, Bunzlau.
" Eder's Jahrbuch"	"Jahrbuch für Photographie und Repro-
	duktionstechnik." W. Knapp, Halle a/S., Germany.
"Il Prog. Foto."	"Il Progresso Fotografico."
n riog. roto.	R. Namias, 27, Via Boccaccio, Mailand, Italy.
"Journ. Chem. Soc. Trans."	"Journal of the Chemical Society: Transactions."
"Journ. Phot. Soc.	"Journal of the Photographic Society of India."
"T B W.	40, Chowringhee, Calcutta, India.
"Journ. Roy. Mier.	"Journal of the Royal Microscopical Society."
"Journ. S. C. I."	"Journal of the Society of Chemical In- dustry."
"Journ. Soc. Arts"	"Journal of the Society of Arts."
"Knowledge"	"Knowledge."
"Le Phot."	"Le Photo Journal." 22, Rue Vurenna, Paris.
" Mon. Phot."	"Le Moniteur de la Photographie." 17, Rue des Moines, Paris, France.
"N. Z. Phot."	"Sharland's New Zealand Photographer." Lorne Street, Auckland, N.Z.
"Nature":	"Nature."
"Oest. Phot. Z.it."	"Oesterreichische Photographen Zeitung." Oesterreicher Photographen Verein, Vienna III/I.
" Opt."	"The Optician."
"P, \1,"	"The Photo-Miniature."
	122 East Twenty-fifth Street, New York, U.S.A.

122, East Twenty-fifth Street, New York, U.S.A.

"Pharm. Journ."	"The Pharmaceutical Journal."
"Phil. Mag."	. "The Philosophical Magazine."
"Phil. Trans."	"Philosophical Transactions of the Royal Society."
"Phot."	"Photography and Focus."
"Phot. Chron." .	"Photographische Chronik." W. Knapp, Halle a/Saale, Germany.
"Phot. Couleurs"	"La Photographie des Couleurs." 118, Rue d'Assas, Paris.
"Phot. Indus."	"Photographische Industrie." 6, Charlotten Street, Berlin, Germany.
"Phot. Journ	"Journal of the Royal Photographic Society of Great Britain" ("The Photo-
,	graphic Journal '').
"Phot. Korr."	"Photographische Korrespondenz." Bäckerstrasse 12, Vienna I, Austria.
"Phot. Kunst"	"Photographische Kunst." Rennbahnstrasse 11, Munich, Germany.
"Phot. Mitt."	"Photographische Mitteilungen." Gustav Schmidt, Königin Augustastr. 28, Berlin W 10, Germany.
"Phot. Monthly"	"The Photographic Monthly."
'Phot. Rund.''	"Photographische Rundschau." W. Knapp, Halle a/S. Germany.
"Phot. Scraps"	"Photographic Scraps."
'Phot. Times'	"The Photographic Times." 39, Union Square, New York City, U.S.A.
"Phot. Welt"	"Photographische Welt." (M. Eger), 28, Grimmaischer Steinweg, Leipsic Germany.
"Phot. Woch."	"Photographisches Wochenblatt." 13, Bendlerstr., Berlin, W.
"Photo-Era"	"Photo-Era." 383, Bcylston Street, Boston, Mass., U.S.A.
"Photo Gazette"	"Le Photo Gazette." 14, Rue des Minimes, Paris, France.
"Photo-Revue"	"Photo-Revue." 118, Rue d'Assas, Paris VI, France.
"Photographie"	"La Photographie." 118, Rue d'Assas, Paris, France.
"Phys. Rev."	"The Physical Review." The Macmillan Company, 66, Fifth Avenue, New York, U.S.A.
'Pro. and Am. Phot."	grapher."
	222, Washington Street, Buffalo, U.S.A.
"Proc. Roy. Soc."	"Proceedings of the Royal Society."
"Procédé"	"Le Procédé" 150, Boulevard de Montparnasse, Paris XIV.

Zeit. für Wiss. Phot.".

"Rev. Trimest."	"Revue Trimestrielle des Travaux de Recherches." A. Lumière et ses Fils, Lyons.
" Sci. Amer."	"The Scientific American."
"Sonne"	Munn & Co., 361, Broadway, New York, U.S.A. "Sonne." Kaiser-Platz, 18, Wilmersdorf, Berlin.
"St. L. and C. Phot."	"The St. Louis and Canadian Photogra- pher." 911, N. Sixth Street, St. Louis, Mo., U.S.A.
'T. Q."	"Telephoto Quarterly."
"Wiener F. Phot. Zeit."	"Wiener Freie Photographen Zeitung." Gustav Walter, Alserstrasse 71, Vienna VIII Austria.
"Wien. Mitt."	"Wiener Mitteilungen." Graben 31, Vienna I, Austria.
"Wilson's"	"Wilson's Photographic Magazine." 289, Fourth Avenue, New York, U.S.A.
"Zeit. für Instr."	"Zeitschrift für Instrumentenkunde." Julius Springer, Berlin,
"Zeit. für Repro.''	"Zeitschrift für Reproduktionstechnik." W. Knapp, Halle a/Saale, Germany.

"Zeitschrift für Wissenschaftliche Photographie." J. A. Barth, 17, Rofsplatz, Leipsic, Germany.

RECENT NOVELTIES IN APPARATUS.

BY THE EDITOR.

[These notices are confined to apparatus introduced since the publication of the last Almanac. In all cases the various articles have come under our personal examination, a rule from which we allow no departure.

The items in this section are indexed in the General Index to Text

placed at the end of the volume.]

THE MORGAN PROCESS OF DRY MOUNTING, PLATE MARKING AND DVE STAMPING AT ONE OPERATION.

(Marketed by O. Sichel and Co., 52, Bunhill Row, London.)

By this process the photographic print is secured to its mount, the latter impressed with a plate-mark, and also with the die impression of the photographer's name or address or other wording—



all at one single operation. This is done, firstly, by the use of a new dry-mounting material or medium, which is applied to the backs of the prints as they come away from the last washing water, or may be applied to the raw paper used for

any of the usual printing processes before it is coated. Papers thus ready for dry-mounting are shortly to be placed on the market, but already a ready-made, self-adhesive, coated transfer paper for use in the carbon process is available, the tissue being transferred direct on to this, and the special coating on the back employed in fixing the carbon print to the mount. The plate-marking is done by laying in register upon the mount a suitable template, or cut-out sheet of metal, which is hinged to a second plate of similar size on which the mount with the print in position is laid, and the former pushed up against the stop upon the plate. The template being then laid over and the whole given hot pressure in a special form of press, the two operations of platemarking and mounting are done together, whilst for the diemarking a suitable die is made to form part of the template. Great depth in the way of embossing or plate-marking is obtainable by this method, which, besides saving time, allows the photographer a very great latitude in the selection of his mounting materials. permits him to indulge his own tastes up to a large degree, and further reduces the manipulation to a degree of simplicity, such that it may be carried out by assistants of very little skill. The press, it should be understood, may be used equally well for these three purposes separately—that is to say, it may be used by the photographer to die-stamp his mounts, or to plate-mark or emboss his mo nting papers.

The photograph shows the template opened with the mount in position. A booklet describing the process and the materials sup-

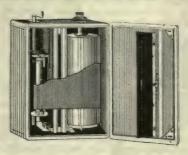
plied for working it may be obtained from Messrs. Sichel.

THE "CIRKUT" PANORAMIC CAMERAS.

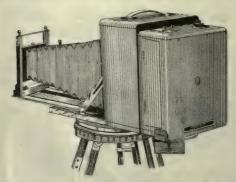
(Made by Kodak, Limited, 57 to 61, Clerkenwell Road, London, E.C.)

Under this name the Kodak Co. have introduced a quite new type of panoramic camera, designed, it need hardly be said, for roll film, and serving for the widest range of panoramic photography. The "Cirkut" has not been designed for, nor is it offered to, the amateur photographer who would take panoramic pictures as a form of entertainment. The apparatus is intended for the most exacting descriptions of expert and commercial photography, and it is not too much to say that from this point of view it is an instrument which occupies a place by itself among photographic equipments. It supplies the means of producing photographs for which there has been in the past a very considerable demand among certain classes of customers, such as railway companies, municipal authorities, estate agents, and others desiring to present a complete and attractive photograph of a scene which cannot otherwise be shown in a single photograph. While hitherto the photographers who have been called upon to do this class of work have had to resort to tedious methods involving the use of a number of glass negatives and processes of combination printing to secure a single photograph, the use of the "Cirkut" camera makes the production of a photograph—even of one including the whole horizon of 360 deg.—as easy a matter as the taking of a single negative with a stand camera.

For in the "Cirkut" a special tripod is provided, round the circumference of which a metal rack is fitted and guides the rotary course of the camera. The camera itself, or the "Cirkut" attachment, which is also sold for use with the Kodak "Century" camera,



is provided with clockwork motive power, the pinion gearing with the rack on the tripod head. Two brakes are provided, so that the speed of rotation can be modified. The camera, therefore, as soon as affixed to the tripod head, is pointed to the subject, and the rotation of the instrument started by pressure on a release. The mechanism of the instrument shows the length of film which is being



used for the exposure, and further perforates the film on the completion of exposure, so that the operator when removing it from the apparatus knows exactly which portion to develop.

The exposure which each narrow section of film receives as it moves in relation to the lens is about 1-10th sec., a fact which may suggest to some that in the case of street scenes and other subjects

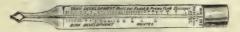
where there are rapidly moving objects this speed will be quite inadequate to secure freedom from blur. It should therefore be pointed out that from the circumstances of the case the "Cirkut" camera has to be placed at a considerable distance from the subject being photographed, and on that account the effect of moving objects is of less importance. When we say that the large panoramic photographs taken with the "Cirkut" of such scenes of incessant traffic as Piccadilly Circus and the Place de l'Opéra are practically free from any blurring due to the movements of vehicles, it will be understood that the scope of the "Cirkut" camera is not restricted on this account. The two illustrations represent first the roll-holder of the camera, whilst the second shows the "Cirkut" attachment to one of the Kodak Company's "Century" cameras. In addition to the apparatus for making the negatives the company also supply long box printing-frames taking film up to 10ft. in length for taking off the prints.

For all those engaged in photography for advertising and commercial illustration the apparatus is certainly one which may be expected to pay for itself within a short time, since the results obtained with it are not to be compared with those secured either by a wide-angle lens or by the tedious processes of double printing.

THE WATKINS TIME THERMOMETER.

(Sold by the Watkins Meter Company, Hereford.)

Still another of the many pieces of equipment with which Mr. Watkins has provided the photographer is now introduced in the shape of this thermometer, which is unlike any instrument of the kind, inasmuch as the scales with which it is provided are not marked with temperatures, but with times of development for certain developers and certain species of plate. Development being more rapid the warmer the developer, it therefore follows that the scale is a descending one, and this fact should not be disregarded, otherwise a mistake may easily be made in reading the thermometer. For example, if the mercury stands half a division above 15, the reading is not 15½, but 14½. Thus the thermometer represents a



variation of the system of providing for differences in temperature in time development, the modified method being to develop for the time corresponding to a certain temperature and to make allowance for the differences among plates as regards speed of development by modifying the composition of the developer; that is, by using it at greater or less dilution. The thermometer itself contains a table giving the dilutions which must be taken for plates of the seven different classes and for four separate developers. These are the Watkins one-solution (time) developer, a pyro-soda and metol-hydroquinone developer (of which the formulæ are given), and, lastly, the one-solution commercial developer, such as Rodinol, Azol, Certinal,

and Victol. Also a separate scale on the thermometer gives the correct time for the various Kodak and Premo film tanks, with their appropriate Kodak tank powders. In all cases an exposure which is practically correct must be assumed in using these methods, and on that account beginners who would make the most of the later forms of assistance which the Watkins Meter Company offer them must not neglect the use of an exposure meter nor the study of the Watkins Manual. The price of the thermometer in a wooden case is 2s, 6d.

A form of the meter for use in developing Autochrome plates is also supplied by the Watkins Meter Company at the same price.

THE "PETROLITE" ENLARGING LAMP.

(Sold by Van Neck and Company, 32, Gray's Inn Road, London, W.C.)]

A new self-contained incandescent light for the optical or enlarging lantern has been designed by A. J. Garrad. The lamp burns petrol (motor spirit), and is of such very simple construction that it is difficult to see how any mishap can occur with it. It consists of a saturater, placed, as shown in the drawing, at the back of the burner; that is to say, outside thte lantern. The saturater is a metal chamber, supported through its centre on a pillar of about ½ in. diameter, which communicates with the burner. The interior of the chamber is filled with an absorbent material, which is charged



by filling it with petrol, allowing the latter to remain for a minute or so and then drawing off the excess. The action of the apparatus is thus to provide the burner with a current of air saturated with petrol, giving a very intense incandescent light without aid of a pump and in a very small space. One very great advantage of the lamp is that by means of the screw beneath the tank the light can be turned quite low. One charge of petrol suffices for a light of six hours' duration, at a cost of about one penny. As regards safety, the saturater can be taken off its pillar and a light applied to it; the only result is to inflame the traces of vapour in the

tube. These features of the lamp should, we think, strongly appeal to those enlarging by artificial light, since even when gas is available, a light of this kind, which allows of the enlarging lantern being placed anywhere, is the most convenient, whilst the light given by it is a very great improvement on the ordinary incandescent burner. The price of the "Petrolite" lamp, complete with burner and mantle, but uncharged, is £1 10s.

THE "A-KLA" DAYLIGHT-LOADING PLATE-HOLDER.

(Sold by the A-kla Company, Sale, Cheshire.)

Of the many systems and pieces of apparatus which have been devised for providing photographers with facilities for carrying plates ready for exposure in the camera similar to those available in the case of roll-film by the daylight-loading spool, we cannot point to one which has enjoyed more than the briefest period of approval. But in the case of the "A-kla" system, which will be available by the time these lines appear in print, the worker can purchase plates to any number at the price of 1s. 3d. per dozen, and these may be transferred in full daylight to the "A-kla" apparatus, which is three things at the same time-namely, the loading chamber and two single plate-holders. Though it is impossible in any printed description to avoid the suggestion that the apparatus is complicated in use, we would say at once that the article itself is absolutely without mechanism, whilst the operation of inserting the plate in a state ready for exposure is one in which the merest tyro cannot unknowingly make a mistake. The plates are supplied in pairs, placed face to face, each pair in a light-tight double sheath of thin metal, the overlapping rebates of the sheaths enclosing the plates secure from light. Thus packed in sheaths, the plates are issued in packets of one dozen, and as each plate is backed up by a non-actinic sheet of tissue paper, cemented to the glass side with a soluble adhesive, the photographer is actually paying the normal price for a backed plate.

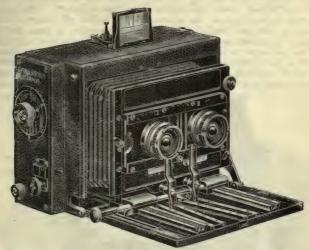
The apparatus in which the plates are exposed consists of a pair of single dark slides, each fitted with a pull-out shutter of the ordinary pattern. The two slides, however, are not alike in other respects. One is provided with a full-size shutter in addition to the pull-out shutter, through which the metal sheath enclosing the two plates is inserted. The other plate-holder is provided with a back, in which is a square aperture, a spring placed across this aperture serving to grip one-half of the sheath and hold it securely in the plate-holder, whilst the other and outside half of the sheath is held against a rebate in plate-holder No. 1. Catches attached to the two plate-holders allow of them being held face to face, making a lighttight joint, so that when the two pull-out shutters are withdrawn the double sheath (containing the two plates) may be placed inside. The back sliding shutter is then closed, and the inner part of the sheath separated from the outer and held by the spring above described. On now re-inserting the two pull-out shutters the apparatus can be taken apart, and gives the worker two single plateholders, each containing a sensitive plate ready for exposure. By reversing the order of these operations—which, as we have said, appear ridiculously lengthy in print—the sheath is put together again, and the two plates can then be removed and retained for any convenient time for developing. The price of the "A-kla" apparatus is 15s., or with the daylight developing chamber described below 25s., the developing tank itself being purchasable separately at 7s. 6d.

For development the "A-kla" Company supply a vulcanite tank consisting of two parts, the inner taking the double sheath, and allowing of the two parts of the latter being separated, so that the surfaces of the plate are exposed for development. The outer or tank portion of the developing apparatus allows of 6 ozs. of any developer being used to develop the plates. But the "A-kla system provides a further novel means of controlling the development. With each pair of plates is provided a small piece of film, one half of which has been exposed to light and developed to a certain depth, whilst the other half has been left undeveloped, but has been treated so that further exposure of light is without effect upon it. This small piece of film is used as a test of the progress of development, the two plates being removed when the "developette," as it is called, has reached the standard tint. The "A-kla" apparatus may, of course, be used for development by time quite apart from the above "test-patch" method, and in any case it must be made clear that the daylight-changing system is applicable to ordinary methods of development in a dark-room. A complete description of this very practical and ingenious apparatus is obtainable from the "A-kla" Company.

THE ZEISS AUTOMATIC STEREOSCOPIC LENS-BOARD.

(Made by Carl Zeiss, Jena, Germany, and 29, Margaret Street, London, England.

The very ingenious device of Dr. W. Scheffer for making stereograms at short range, whereby the separation of the pair of stereoscopic lenses is automatically adjusted by the focussing pinion of the camera, has now been put on the market by the firm of Carl Zeiss as a separate accessory, which is carried in a leather case measuring 44in. by 44in. by 14in. The illustration shows it fitted to the camera in place of the ordinary lens panel. Its addition is the work of only a few seconds, the camera being racked out to its greatest extension and the panel slipped into place with the points of the levers in the grooves on the camera baseboard, these grooves being sold with the accessory panel. On now racking the camera in and out when focussing, no adjustment of the distances between the lenses is necessary. The grooves themselves control this, and relieve the photographer himself from the necessity of supervising this necessary condition to the best stereoscopic work. When taking objects same size the distance between the lenses is 1 3-16ths. whilst when photographing distant objects it is 2 5-16ths. lenses cannot be in the sunk type of mount, owing to the necessity for bringing them close together, it is necessary to remove the automatic panel when closing the camera, an operation which, owing to the mechanical perfection of the workmanship, is just as smooth



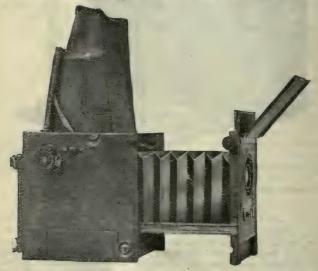
and rapid as the insertion. Complete with two grooves, the price of the panel is £3 15s., ready for adjustment to a Zeiss 9×12 centimetre stereo "Palmos" or to other suitable instruments.

THE "MINEX" REFLEX CAMERA.

(Made by Adams and Co., 24, Charing Cross Road, London, W.C.

In reviewing previous models of the Adams reflex we have confessed to finding it difficult to see what further refinements could be introduced into these instruments of precision, but in the pattern, the "Minex," which supersedes the two varieties of "Videx" which we reviewed last year, Messrs. Adams have, nevertheless, made really notable and practical advances. Within the past few years reflex cameras have practically all of them approximated to a type, though every make on the market has certain distinct features. To get one or even two given kinds of movement into a reflex is not difficult, but to embody in one instrument, and that a camera of the minimum size, the full range of facilities which a reflex camera worker can demand calls for the highest degree of mechanical skill. We are not exceeding the facts when we say that no other reflex camera provides (1) an equal range of movements, (2) an equal rapidity of manipulation, and (3) an equal degree of reduction to the fewest adjustments—all within the very smallest space.

The provision of these latest facilities in the Adams "Minex" centres round the shutter, which is of an entirely new pattern and works in conjunction with the mirror, the single three-quarter turn of the winding key serving not only to set the shutter but automatically to put down the mirror after the exposure. Not only this, the adjustment of the shutter to the series of instantaneous speeds, as also to "bulb" and "time" exposures, is done simply by slightly pulling out the winding key and setting a case attached to it to one or other of the points on a circular scale. And in doing this it is immaterial whether the shutter be set or not, and, further, the speed at which the shutter is working cannot be altered, except intentionally, and is indicated both while the shutter is set or is run



down. This applies not only to the various rapid exposures, but to "bulb" or "time." In these two cases the indicator is simply turned to "B." or "T.," and, in the former case, pressure on the release commences the exposure, which continues until pressure is released, whilst, in the latter, exposure commences on first pressing the release and is ended by giving a second pressure. The wide range of instantaneous exposures is secured by aid of an auxiliary spring, so that alteration of spring tension is avoided. Tension is changed from one to the other by turning the diamond-shaped lever seen in the bottom left-hand corner in Fig. 1. In using the shutter, exposures marked in red on the speed dial are those obtained when the tension lever is set to "red." Thus it will be seen that there are no buts about the "Minex" shutter

The shutter itself safeguards the photographer from adjusting it when he should not do so, and it may be claimed to be immune against derangement by those even the most inexperienced. Even so, the makers affix the panel giving access to the mechanism of the shutter and mirror so that with the aid of a pocket serewdriver it is immediately got at.

The camera is fitted with the rotating back working in a substantial German silver bearing, as in the previous models, but a new feature with the "Minex" is an ingenious masking of the focussing screen effected automatically by rotating the back, so that the picture seen on the screen is always the upright or the horizontal corresponding with the position of the plate. This is done, not with a rotating mask, which is a more bulky device, but by means of a pair of metal strips which in one or other position mask opposite sides of the ground glass.

The frontal mechanism of the camera remains very much the



same as in previous models. As before, the lens panel is of extra large size, accommodating the largest lenses, as also the very convenient four-way swing front, which is now issued with still a further minor improvement as regards operating it. As seen in the photograph, the camera has unusually large lens shade, the rising front is operated by rack and pinion, and gives the maximum rise, whilst the whole front at its full extension of 12½ ins. in the quarter-plate size is remarkably rigid.

The hood, which is of the type brought to perfection by Messrs. Adams, carries within it a pair of magnifying lenses which can be used or dispensed with as desired, but do not add to the bulk or form a separate accessory. Further, a ground glass for use at the back of the camera, as when focussing on a tripod, is carried between the hood and the board, to which it is attached, being thus secure from accidental damage. And this same feature of self-containedness is carried out in the chamber at the base of the camera, which provides space for two dark slides, so that, with a third clide carried ready for exposure, the photographer can go out pre-

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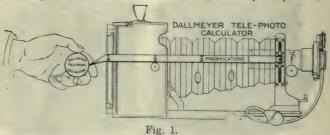
pared with six plates without having to carry anything but the camera.

We doubt if the maker of this beautiful and well-constructed camera in his most sanguine moods can see any means of further improvement. The camera is a universal instrument ready for use with any lens suiting the size plate it is made to take and with any description of exposing apparatus, whether dark slides, changing boxes, film pack, or envelope adapter. Complete with three double dark slides, but without lens, the price is the same in the $3\frac{1}{2} \times 2\frac{1}{2}$ ins. and quarter plate sizes—namely, £29; £32 in 5 × 4 ins., and £41 in half-plate. An extra to these prices is the charge for the four-way swing front—namely, 30s. in half-plate and 25s. in the three other sizes.

THE DALLMEYER TELEPHOTO CALCULATOR.

(Made by J. H. Dallmeyer,:Limited, Denzil Road, Neasden, London, N.W.)

The use of a graduated tape in estimating the magnification given by a telephoto lens has been carried out in the very compact form



represented by this little attachment. It consists of a spring stop measure, marked with a scale of magnifications corresponding with



the negative attachment. The free end of the tape is provided with a small hook, which can be attached to the lens front, the camera

extension thus serving to indicate at a glance the magnification at which the lens is working. The little accessory weighs a shade over one ounce, and, as shown in the second drawing, which is a full-size reproduction, may be carried in the waistcoat pocket. The reverse side of the tape is graduated in inches. In ordering the calculator it is necessary to specify the focal length of the negative lens, the distance from the back surface of the negative to the point on which the hook of the tape will be fastened, and also the approximate total thickness of the glasses composing the negative. Graduated for a particular lens, the price of the apparatus in brass is 2s. 9d. Additional scales may be marked at a cost of 1s. each, and a morocco case for the calculator is supplied at 2s. 6d.

THE 'GOERZ' FOLDING REFLEX CAMERA.

(Made by C. P. Goerz, Optical Works, Limited, 1 to 6, Holborn Circus, London.)
Messrs. Goerz, whose reputation in the matter of folding focalplane hand-cameras is of longer standing than that of any other
firm, and second to none in the design and substantial manufacture of their instruments, have made quite a departure in bringing



out a reflex camera. That the Goerz factory should provide photographers with a reflex instrument was a natural assumption, but that they should start by essaying the doubly difficult task of providing a camera of this type which would fold up was perhaps not to be expected, and therefore the mechanical perfection of the

new Goerz reflex is all the more a matter for congratulation. The new camera is made in one size only, 5×4 in., and measures when closed $7\frac{3}{4} \times 7 \times 3\frac{3}{8}$, weighing, without the lens, 4lb. 6oz.

The back body of the camera carries the focal-plane shutter, which is of the Goerz latest pattern, giving both the most rapid exposures and automatic time exposures. Two rigid arms fixed in the back frame hold the front of the camera, and are turned downwards when the camera is folded, so that the lens points straight down when the user carries it by the strap. The operation of opening the camera ready for use consists simply in grasping the lens and moving it upwards and outwards until it comes into the normal position. This operation at the same time automatically depresses the mirror, and leaves the ground-glass in the position for exposure, so that the camera may be carried folded with the shutter set and a plate ready for exposure, and be ready for action within a second or two. Similarly, to close the instrument the two side struts have simply to be pressed downwards and the lens returns to its normal position.

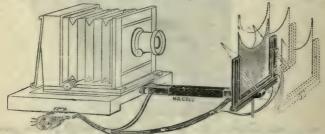
The movement of the mirror and the quick adjustment by which it is raised or lowered by a half-turn of the milled screw are points to be mentioned, as is also the rigid manner in which the focussing screen is held in a solid metal frame on all sides. In other words, the camera realises the conditions which are necessary in a reflex camera of precision, while its lightness and portability bring it almost into line with a folding focal-plane camera of the ordinary type. The price of the instrument (5×4) , complete with Goera

anastigmat, is £24 16s.

THE "GOOD" STUDIO VIGNETTER.

(Made by Marion and Co., Limited, 22 and 23, Soho Square, London, W.)

This ingenious piece of apparatus provides a new and very facile means of working the vignetting mask which is used at the time of photographing the sitter. In place of rigid metal adjustments, which are liable to stick, and, in any case, do not give a great



range of movement, the vignetter is operated by a modification of the Bowden flexible wire connection. As shown in the drawing, the vignetting mask is mounted in a frame which travels upon a bar of square section attached to the front of the camera baseboard. The travel of the vignetter—as also its adjustment up or down, sideways, and in a swing direction—is done by means of pressure only on four levers all placed together in a single mount. This may be attached to one side of the camera, as illustrated, or may be placed practically in any convenient position, the mechanism operating the vignetter irrespective of the length or course of the connections. The operator can thus modify the action of the vignetter whilst watching the effect upon the screen, in which connection it may be mentioned that the vignetter is pivoted along an axis opposite to the lens, so that when tilted the displacement does not alter the level of the serrated edge. This useful apparatus is sent out with the arm in two pieces and complete with screws for putting together. The whole attachment is fitted to the camera in a few minutes. The price of the "Good" vignetter is £2 5s.

THE "ENSIGN" FILM-PACK AND ADAPTER.

(Made by Houghtons, Limited, 88 and 89, High Holborn, London, W.C.)

The users of cut films will be interested in hearing of this latest device (for the exposure of flat films, purchased ready for use in a



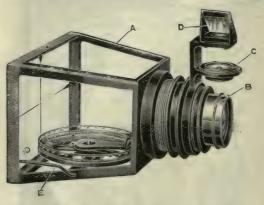
pack). The adapter consists of a chamber of light metal measuring only $6 \times 3\frac{3}{4} \times \frac{3}{8}$ in., or scarcely half the size of a double slide.

It is provided with a series of six keys, any one of which is pressed down as the shutter of the slide is withdrawn, and thus leaves ready for exposure in the camera that particular film. The action we have found most simple and certain. As the box may be reloaded by the user himself after development, this convenience of exposing the films in any order may frequently have an advantage. The film is held very flat in the focal-plane, and may thus be recommended for users of large-aperture lenses, where perfect evenness of the sensitive surface is a great consideration. In quarter-plate size the price of the adapter is 25s., and of the pack of six "Ensign" films, ready for use, 1s. 9d.

THE ALDIS PHOTO-SURVEYING ATTACHMENT.

(Made by Aldis Brothers, Old Grange Road, Sparkhill, Birmingham).

This is a piece of apparatus for use with an ordinary stand camera, enabling the latter to be employed for the making of accurate survey negatives—that is, negatives from which the dimensions of the subject can afterwards be plotted off. It consists of a rigid metal framework, the back frame of which is provided with fine



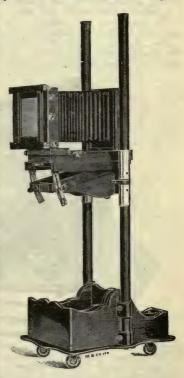
cross wires. A compass, the reading of which is impressed on the plate by the exposure, is mounted in the base of the frame, whilst the lens, which is made one with the apparatus, has attached to it a level and right-angled mirror, serving for conveniently adjusting the camera level. The mechanical features of the apparatus allow of it being very rigidly secured in any ordinary stand camera, as shown in the drawing. The price, complete with the No. 1 Aldis anastigmat, compass, and pointers, etc., is £5, including fitting, or without compass £4.

THE "HANA" STUDIO STAND.

(Sold by Marion and Co., Limited, 22 and 23, Soho Square, London, W.)

Professional photographers who have craved a studio stand which should permit of the very widest range of up-and-down movement and at the same time allow of the rapid manipulation of the camera with the minimum physical exertion should be satisfied with the new stand placed on the market by Messrs. Marion from the designs

of Mr. Hana, the well-known photographer, of Bedford Street, Strand. The stand consists of a pair of steel hollow tubes rigidly bolted to a base stoutly constructed in polished wood. Between the tubes a platform travels up and down vertically, its course being controlled by the two tubular pieces moving on the upright pillars. The platform is attached to these two pieces in such a way that the photographer standing at the back of the camera can tilt it at any desired angle. The whole combined weight of platform and camera mounted upon it is counterbalanced by weights moving in the tubular support, a thin wire cable tested to a weight of 200 lbs. connecting the platform with the counterweight. As a result of this the force required to raise or lower the camera is infinitesimal, whilst the length of the pair of supports allows of the camera being placed as high as 7 ft. and as low as 2 ft. above the ground. After placing at any point the camera is instantly clamped by a species of band-brake, which is operated by a single pull of its lever. Similarly, the angle at which the platform is tilted



is fixed by turning down the handle seen on the right of the drawing. The support of the camera in each case is of the most rigid description. It should be added that the counterbalancing weight can be removed at the base of the tubes and reduced or added to as may be necessary, or, if more convenient, the exact balancing can be struck simply by placing a small veight, or even a box of plates, on the camera platform. The stand is made to take studio cameras up to 12 × 12 ins., and costs, complete, £8.

THE "KLIMAX" POSTCARD FRAME AND PRINTERS.

(Sold by W. Butcher and Sons, Limited, Camera House, Farringdon Avenue, London, E.C.)

In these pieces of apparatus Messrs. Butcher provide a frame which can be used in the dark-room for taking off a number of identical prints from a negative in the ordinary way, or may be obtained as a printing machine with which exposure after exposure may be very rapidly given without the escape of any light in the dark-room. The frame is identical in each case. In the printers it forms the top of the apparatus, two patterns of which are made, one for electric

light and another for incandescent gas.

The "Klimax" frame will take a negative from 7 × 5 inches to the smallest size. As shown in the drawing, it consists of a mahogany frame, the aperture in which is filled by a piece of ground



glass. On this the negative in a suitable carrier is laid, the carrier for the sensitive paper or postcard is placed over the two studs and the spring clamps brought down in order to fix both negative and print carrier. The negative is roughly placed in position when laying it in its carrier upon the ground glass, but the final exact adjustment may be made with the springs down. Things having been thus arranged, the sensitive paper is placed in the space of the print carrier, the spring-back brought down, and an exposure made, these two operations succeeding each other very rapidly and allowing the worker to turn out a great number of prints (all identical as regards the placing of the picture) in a very short time. The price of the

printing frame, complete with carriers for quarter and half-plate and with three masking gauges for the making of quarter-plate, post-card, and half-plate prints, is 6s. 6d. Two extra sets of gauges are supplied, No. 1 to give six assorted openings quarter-plate size, and No. 2 the same number for postcard size, the price in each case being 1s.

Of the two printers we illustrate the No. 2 model fitted with electric light. It consists of a box measuring 9 x 12½ inches by 9½ inches high, the top of which, as has been said, is formed by the "Klimax" frame. The interior of the box, which is accessible by a hinged door at the front, contains an incandescent lamp, which is connected by means of a flexible cord and plug, supplied with the printer, to any electric-light fitting. The adjustment of the negative and the printing paper is made exactly as when using the printing frame, except that as regards exposure the act of bringing down the pressure-pad upon the paper automatically switches on the light, which is switched off when the pressure is removed. When light is required for the purpose of adjusting the negative the plug seen to the left of the frame is simply pressed down. The printer, which is well made in polished mahogany, is sold for £1 5s., complete with two yards of flexible connection, plug, two negative carriers, and three printing masks, and provides a most inexpensive and effective means of postcard printing.

In the model No. 1 for incandescent gas the burner is placed outside the apparatus and a mirror is provided in order to reflect the light up through the ground-glass screen. In this case, also, the act of bringing down the pressure-board provides the illumination for the exposure, whilst also, as in the electric light model, the worker can obtain the illumination even when the pressure-board is up by actuating a stud which depresses the bye-pass of the burner. The incandescent gas model is sold at the price of £1 10s.

THE STEREO-PANORAM CAMERA.

(Sold by Ross, Limited, 3, North Side, Clapham Common, London, S.W.)

This is a very ingenious and practical metal camera taking plates $5\frac{1}{8} \times 2\frac{3}{8}$ inches in single metal slides, and serving for making a pair of stereoscopic exposures, or one single picture of panel or panoram shape. The camera is fitted with a pair of Ross anastigmats f/8.5 of $3\frac{1}{8}$ inch focus. The shutter, placed on the inside of the camera front, works just behind the lenses, and provides the exposure both for the pair of stereo pictures, or for the whole plate, with one of the lenses placed centrally on the camera front. This latter alteration is made in an instant; one of the lenses is mounted to one side of a circular rotating panel, and the lever which brings it into the central position automatically removes the stereoscopic partition, and, at the same time, puts out of action the two side portions of the shutter working in conjunction with the pair of lenses. The camera is similarly conveniently fitted with

a direct-vision finder serving both for stereoscopic and wide angle or panoram use. It carries a two-way level, two strong bushes for use on a tripod, and the necessary adjustments for a series of speeds from 1-10 to 1-75 sec. One good point is the mounting of the



lenses slightly above the centre so as to avoid excessive foreground, and to allow, without rise of front, of tall buildings being included. Complete with six single dark-slides and leather case for the outfit the price is £12 8s.

THE "ROBINSON" ENLARGING AND COPYING CABINET.

(Made by Marion and Co., Limited, 22 and 23, Soho Square, London, W.)

Messrs. Marion, who have of late specialised in the application of electric light to photographic purposes, are introducing this very practical form of enlarging apparatus, in which a very even illumination of the negative up to 12 by 10 size is obtained without the use of a condenser. The light is secured by a series of eight metallicfilament lamps arranged to illuminate a surface of white paper, and the reflected light thus cast through the negative is found to be amply sufficient for enlarging. This is due, as users of metallic-filament lamps will realise, to the much greater actinic power of this type of electric lamp. Not only can the apparatus be used for enlarging, but by replacing the white paper reflector by a black copy-board the cabinet serves admirably for all kinds of copying work and for the photography of small objects, articles of manufacture, etc., for catalogue illustration. To this end also it is provided with four sets of switches for the lamps, so that, if necessary, the illumination on one side or other of the original may be modified. As supplied, the cabinet may be used as an enlarger in conjunction with any good camera, whilst when employed for copying purposes it simply takes the place of the easel and of any illuminating system which the photographer may previously have had in use.

THE "PRIMUS" NON-STAIN PRINT LADLE.

Sold by W. Butcher and Sons, Limited, Camera House, Farringdon Avenue, London, E.C.)

One of those handy contrivances of which, under the name of "Primus," Messrs. Butcher in their time have introduced a large number, has been placed on the market under the above name, and, as shown in the drawing, consists of a rubber ring about 2 ins. in diameter mounted on a handle of hard wood. This "print ladle" provides a very neat means indeed of transferring

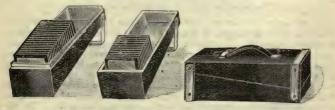


prints from the toning or developing bath to the wash-water and thence to the fixing solution, the worker having no need to allow his fingers to come in contact with the hypo bath. The ladle serves very nicely to lift a print from its bath and after transference to press it gently beneath the surface of the hypo solution, and it should be its own recommendation to those who print on either a large or small scale. The price of the ladle is 1s.

THE "EXCELSIOR" TRANSIT BOX.

Made by the Camera Construction Company, Eagle Works, Durham Grove, Hackney, London, N.E.)

In this box for sixty lantern-slides the diagonal construction, seen in the drawings, provides the very practical convenience that the lid of the box may be used as a receptacle for the slides as

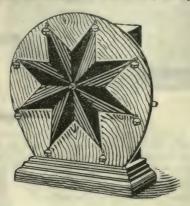


hey come from the lantern. The box is made with a very deep rabetted joint, serving very efficiently to exclude dust. It is fitted with a strong brass clamp at each end and substantial leather handle. The price in white wood, finished in black, is 3s.; in polished mahogany, 4s. 6d.

THE PHOTO STAR.

(Sold by F. E. Jones and Co., 22, Gray's Inn Road, London, W.C.

This apparatus is an accessory for the studio, and forms an attractive means of securing the attention of sitters of tender age. It consists of a star formed of points of coloured metal, to each of which a small bell is attached. The "Star" is driven by clockwork mechanism, which also actuates a musical-box, the apparatus being



set a-going simply by raising a lever by the side, when the star revolves and the music (with bells) plays until the lever is depressed, by which time the photographer should have secured a pleasing portrait of his child-sitter. The price of the apparatus, inclusive of packing and postage (inland), is 10s.

"COUNTESS" POCKET CAMERAS.

(Sold by Sherwood and Seldt, 15, Mount Pleasant, London, E.C.)

In this series of cameras, the manufacture of the firm of Brexler and Nagel, of Stuttgart, a degree of compactness and particularly of almost wafer-like slimness is attained. We have before us three quarter-plate cameras, each sold as the "Countess," qualified by the Nos. 703, 723, and 333 respectively. In the two former, focusing is done by sliding the lens front along its runners, the front automatically snapping into focus for distant objects when the camera is drawn out on its baseboard. The actual thickness of the instrument when folded is distinctly under \(\frac{1}{2} \) in., the size being $4 \cdot \frac{1}{2} \times 5 \cdot \frac{1}{2}$ ins. In the case of the No. 833, which is a double extension camera with rack and pinion focussing, the camera when folded is a little thicker, but scarcely over 1 in. Yet all three instruments are provided with rising front, direct-vision finder, and, owing to their construction throughout in metal, are strongly made and firm when

erected for use. No. 703 is fitted with a single lens working at f/12.5, No. 723 with a doublet working at f/7.7; both these lenses are mounted in a diaphragm shutter adjusted to time, bulb, and one instantaneous speed, in addition to a fourth adjustment which protects the lens from exposure by accidental pressure on the release. In the case of the No. 833 the camera at its full extension gives a distance from diaphragm to plate of 10 ins. In this camera the doublet lens is mounted in shutter provided both with B and T and a series of exposures from 1 to 1-100 sec. These instruments are issued at the very moderate prices of £2 3s. for the No. 703, £3 3s. for the No. 723, and £4 4s. for the No. 833, in each case complete with three single metal slides in carrying case. These quite new models of pocket cameras should secure for themselves a great deal of interest among those commencing photography, and, of course, among dealers in photographic requisites.

In addition to the above cameras there is also a series of still smaller size represented first by the Nos. 101 and 21, taking a picture $1\frac{3}{4} \times 2\frac{1}{4}$ ins., the outside dimensions of the camera being only $3 \times 3\frac{1}{2}$ ins. by less than $\frac{3}{4}$ in. thick. To the No. 101, which sells at 37s. a single achromatic lens is fitted with shutter, giving time, bulb, and one instantaneous exposure, whilst in No. 21 a Staeble "Isoplast" lens of f/6.3 is provided at a price of 69s., although with Rodenstock aplanat f/7.7 the price of the tiny camera is 47s. Though the camera permits of focussing, the short focus of the lens renders any adjustment unnecessary. In each case the above prices refer to the camera complete with three metal single slides in case.

In the No. 22, taking a picture $3\frac{1}{2} \times 2\frac{1}{2}$ a speeded shutter is fitted, and the lens has rising panel with automatic catch, direct-vision finder and infinity catch. Complete with three metal slides and adapter for "Premo" film-pack, the price with "Medioplast" lens working at f/7.7 is 56s. The camera when closed has the very small dimensions of $3\frac{1}{2} \times 4\frac{5}{8}$ ins. $\times \frac{7}{8}$ in thick.

THE "CINEPHONE."

(Made by the Warwick' Trading Co., Ltd., 113, 115, and 117, Charing Cross Road, London, W.C.)

This is a gramophone talking-machine provided with a special accessory by means of which the special "Cinephone" films may be shown in any cinematograph lantern in exact synchronism with the words which go with them. A special record for the gramophone is placed on the disc of the latter in the ordinary way. A pinion from the gramophone is connected with the indicating box seen in the illustration, and on the appearance of the word "Cinephone" on the lantern screen the gramophone is started by pressure on the release. On the dial of the indicating box there shows (in the dark) a white line, which is moved by the gramophone mechanism round the dial, on which are four illuminated dots. A similar dial is photographed along with the subject at the time of taking the pictures, and, therefore, all the operator has to do to preserve exact

synchronism is to work the projector so that the pointer on the screen keeps time with that attached to the gramophone. We have seen for ourselves the very efficient way in which these talking pictures are produced. The price of the "Cinephone"—that is, of



the full-size gramophone complete with indicator—is £9 10s. in travelling case. The Warwick Trading Company have a considerable number of films and records for use on this very ingenious system. These they supply on an advantageous hire system.

THE DALLMEYER "STIGMATIC" LENS, SERIES IV. f/6.3.

(Made by J. H. Dallmeyer, Limited, 83, Denzil Road, Neasden, London, N.W.)

In this lens Messrs. Dallmeyer have provided a new variety of the well-known "Stigmatic" series, which, by a simpler type of con-



struction, they are able to issue at a lower price, whilst at the same time the lens has certain novel features which will strongly

appeal to the amateur worker confined to one instrument and that one of moderate price. The lens is made of unsymmetrical design. the back combination giving a picture nearly twice the size of that of the complete lens, whilst the front lens used alone gives a picture three times the size. Not only this, but the extra extension required when using these components is very much less than usual, the back lens, in the case of the quarter-plate of 43 ins. focus requiring only an additional extension of 2% ins., whilst the front lens needs a little more than double the extension of the complete anastigmat. This feature of the lens particularly fits it for cameras which have not the very largest amount of extension, whilst the covering power of the complete lenses is excellent for the plate for which they are listed, and at a medium stop suffices for a plate of the next or even a larger size. In cases where price is the decisive consideration the Series IV. may thus be purchased in place of the Series II. "Stigmatic." The Series IV. are made in four sizes of 43, 6, 7, and 84 ins. focal length, the prices being £3, £3 10s., £4 5s., and £5 15s. respectively.

THE "ACTO-MIDG" MAGAZINE HAND-CAMERA.

(Sold by W. Butcher and Sons, Limited, Camera House, Farringdon Avenue London, E.C.)

This magazine hand-camera includes quite a number of novel features, chief among which is the provision on the top of the camera of an actinometer, the time taken for the paper to darken to the standard tint being used as the number to which to set the shutter. Thus, an actinometer number of four seconds means that the shutter pointer is to be set to 4, which is the same thing as 1-60th sec. The diaphragm scale is similarly turned to the class of subject being photographed, portraits and near objects being taken at f/11, and clouds and open seascapes at f/32. Street scenes, on the other hand, are worked with a lens at f/16. These movements are calculated so as to give the plate a sufficient degree of exposure, and should be of much use to the amateur worker for At the same time, it is necessary, in the case of this purpose. moving objects, to use the shutter at a greater speed than is warranted by the actinic value of the light, but in such cases the readings of the exposure-meter give the worker a useful indication as to the extent to which he can reduce the correct exposure. The camera is further provided with an automatic signal, which shows a red disc when a plate has been exposed. The magazine carries twelve plates, which are changed by a very simple movement, is fitted with reversible brilliant finder, bushes for vertical and horizontal pictures, all at the price of £2 2s., with single achromatic lens. For £3 3s. the camera is fitted with "Aldis" anastigmat working at f/7.7 and fitted in mount focussing objects up to 6 ft.

THE PHILLIPS PHOTOGRAPHIC FOCUSSING SCALE CHART. (Made by W. H. Phillips and Son, 98, Truro Road, Wood Green, London, N.)

A very useful chart, allowing of a focussing scale for any lens from 3 to 10 ins. focus being prepared without any calculation for distances from 5 to 100 ft., has been drawn up by Messrs. W. H. Phillips, and is issued by them at the price of 2s. 7d., post free, in cloth-covered case. The chart may also be used as a means of ascertaining the focal length of the lens. This is done by first focussing the lens on an object at a great distance, and marking the position of the lens-front on the fixed baseboard of the camera. An object at 5 ft. distance is then focussed, and a second mark made on the baseboard. On comparing the distance between the two marks with the distances on the chart representing the focal extension for 5 ft. and 100 ft., the focal length of the lens being

THE "EWON" SELF-ADJUSTING ARC LAMP.

examined may be picked out among those given.

(Sold by A. E. Staley and Co., 19, Thavies Inn, Holborn Circus, London, E.C.)

In this very convenient and portable lamp the feed of the carbons is controlled automatically, so that on coupling the lamp with the circuit the arc is at once struck without further adjustment, and will continue burning uniformly without attention. The two adjustments provided are for raising the lamp as a whole and

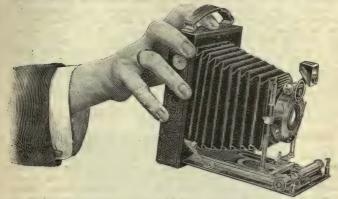


for moving it sideways in the lantern. The lamps are sold complete with resistance plug, switch, and 10 ft. of flexible connection, at prices from £3 5s. to £27, according to the amperage and voltage. The smaller lamps are the most useful for moderate-power projection and enlarging. That taking 6 amperes (direct current) gives a light of about 500 candle-power and costs £5 10s. A 15-ampere lamp for direct current will cost £9 5s., and give a light of about 1,500 candle-power.

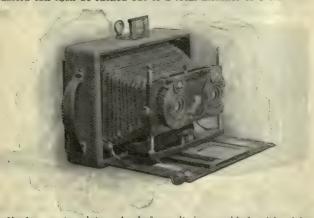
THE QUARTER-PLATE AND STEREO FOLDING "TENAX" CAMERAS.

(Made by C. P. Goerz Optical Company, Limited, 1 to 6, Holborn Circus, London, E.C.)

In addition to the $3\frac{1}{2} \times 2\frac{1}{2}$ "Tenax" reviewed in a previous "Almanac," the makers now have a quarter-plate model measuring,



when folded, just under $6 \times 4\frac{1}{2} \times 1\frac{3}{2}$ ins. As in its predecessor, the lens front is automatically extended by a pair of band springs, and the camera can then be racked out to a total distance of 9 ins. from



· lens diaphragm to plate. As before, it is provided with rising front each way of the plate, reversible brilliant finder, and hooded focussing screen. Complete with Goerz "Syntor" lens, "Com-

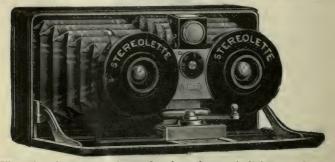
pound" shutter, and film-pack adapter, the price is £8; or, with Goerz "Dagor," £10.

In the stereoscopic pattern the front pulls out upon its runners in the usual way, and is then racked forward to a total extension of 11 ins., the baseboard being clamped firmly at any point by pushing in the focussing head. The front carries a pair of Goerz "Dagors" of 120 mm. focus, each mounted in "Compound" shutters and placed on a panel, which is instantly detachable, and can be replaced by one carrying a "Dagor" of 150 mm. serving to cover the full size plate taken by the camera—namely, one of 10×15 cm. (= 4×6 ins., or postcard). The stereoscopic partition is also quickly removed, and the camera, as also the quarterplate "Tenax," is an example of the beautiful mechanical work of the Goerz factory. The price, complete with the three lenses and three single metal slides and film-pack adapter, is £26 10s.

THE "STEREOLETTE" CAMEO CAMERA AND ACCESSORIES.

(Sold by W. Butcher and Sons, Limited, Camera House, Farringdon Avenue, London, E.C.)

Messrs. Butcher have lately provided the amateur worker with a variety of stereoscopic cameras and accessories at popular prices such as have not previously been at his disposal. Their special handbook, "Stereoscopic Pictures and How to Make Them," which is sent free on application, should be studied as an elementary introduction to stereoscopic photography, and as showing the very complete equipment, from the camera to printing accessories and viewing instruments, which Messrs. Butcher are able to offer. In the "Cameo Stereolette" a plate $4\frac{1}{2} \times 1\frac{3}{4}$ ins. is used (107 × 45 mm.).

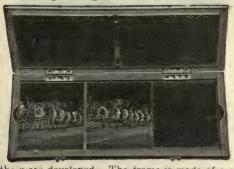


The tiny instrument is made throughout of light metal, and measures, when closed, under $3\frac{3}{4} \times 5\frac{1}{4}$ ins., and is barely $1\frac{1}{4}$ in. thick. It is provided with double ever-set shutter, having time, bulb, and instantaneous adjustments, level, brilliant finder, and focussing scale from infinity to 4 ft. At the price of £3 10s. the camera is fitted with a pair of R.R. lenses working at f/8, whilst for £8 it is supplied with f 6.8 anastigmats. and at £12 with Goerz f/6.8 "Dagors." There is a rising front and convenient diaphragm adjustment actuating both lenses simultaneously. The camera is designed to take single metal dark-slides, or, with special focussing screen, a film-pack adapter.

THE "PRIMUS" STEREOSCOPIC TRANSPARENCY FRAME.

(Sold by W. Butcher and Sons, Limited, Camera House, Farringdon Avenue, Londo., E.C.)

In this Stereoscopic Transparency Printing Frame the makers have conveniently provided for the printing, from the undivided stereoscopic negative, of a transparency by contact, ready for observation in the stereoscope. This is done by making the frame of such dimensions that when the negative is pushed to one end and the transparency plate to the other the portions which overlap come exactly opposite the central opening, which is provided with a brass sliding shutter. The relative positions of negative and transparency having been reversed, a second exposure is



given and the plate developed. The frame is made of a size for the "Stereolette" camera $(4\frac{1}{4} \times 1\frac{3}{2})$ for 4s. 6d., or of the standard, $6\frac{3}{4} \times 3\frac{1}{4}$, plate at 6s. 6d., in each case being well made in polished wood, and provided with spring contact pressure board.

The principle of the transparency frame just mentioned is extended in these gauges to development or printing-out papers. The gauge consists of a stout cardboard in which is an aperture the size of the stereoscopic picture, say $1\frac{1}{2}$ ins. in the case of the "Stereolette." There are two series of stops on the gauge, one for the negative and another for the postcard. In printing, the negative is pushed up to the right-hand stop and the postcard to its left-hand stop, exposure given either by printing-out or exposing to artificial light, and the relative positions of postcard and negative reversed—that is to say, the postcard pushed to the right-hand stop and the negative to the left. A second exposure gives the complete stereoscopic card, which is then toned or developed. These very inexpensive and convenient gauges are supplied for negatives $4\frac{1}{4} \times 1\frac{3}{4}$, 1s. 3d. each, for postcard negatives $5\frac{1}{2} \times 3\frac{1}{2}$, 1s. 3d. each, and for $6\frac{2}{3} \times 3\frac{1}{4}$, 1s. 6d. each.

THE "PANCRATIC" TELEPHOTO LENS.

(Sold by A. E. Staley and Co., 19, Thavies Inn, Holborn Circus, London, E.C.)

This is a very portable telephoto lens complete in itself, and giving magnifications from three to eight times. The focal length of the positive being about 6 ins. and that of the negative about 3 ins., with a camera extension of about 6 ins., it covers the quarter-plate excellently at three magnifications—that is at the lowest power at which it is made to work, whilst at the higher magnifications the little lens can be used quite well on a half-plate. The fact that



the positive lens is single is no doubt responsible for the very bright images given by the "Pancratic." The lens is sent out in a pair of separate mounts ready for screwing into shutters of the Bausch and Lomb "Automat" type, etc., a pair of extra metal cells being included in order to fit it for use with any commercial pattern of diaphragm shutter in general use The price of the lens thus complete in a neat leather case is £3 3s.

THE ERNEMANN "VEST POCKET" CAMERA.

Sold by Charles Zimmermann and Co., Limited, 9 and 10, St. Mary-at-Hill, London, E.C.)

Of pocket cameras for plate, quarter-plates and under, we have seen many varieties of late, but for a really nice model at a moderate price of a pocket camera we have seen none that combines so many good features as the camera made under the above name by the well-known firm of Ernemann. The camera takes pictures a shade larger than $2\frac{1}{4} \times 1\frac{5}{8}$ in., and measures outside less than $3\frac{1}{2} \times 2\frac{1}{2}$ ins. by $1\frac{1}{3}$ in. thick. It is self-erecting, the front coming out into the position of focus for distant objects on pulling down the baseboard. Naturally with a lens of the short focus of $3\frac{1}{4}$ ins. the depth of focus is very great, nevertheless the makers provide focusing for objects up to $4\frac{1}{2}$ ft. from the camera, but for 90 per

cent. of the exposures there would be no need to use this adjustment, since at the full aperture of the lens all objects up to 10 ft. of the camera will be in sharp focus. The lever focusing movement, we would add, as befits such a small instrument, is very smooth, and the pointer very nicely adjusted on the scale. The camera is fitted with two brilliant finders for horizontal and vertical pictures, with diaphragm shutter giving time, bulb, and five instantaneous speeds, and rectilinear "Aplanat" lens working at



f/6.8, the prices being 45s. and 55s., according to the shutter, inclusive of hooded focusing screen and three single metal slides in a wallet about the same size as the camera. For 85s. and 95s. respectively the camera is fitted with the Ernemann anastigmat f/6.

A daylight enlarger can be supplied for the camera to enlarge up to ½-plate. The negative is placed under a frame at one end, and a piece of bromide paper or a plate at the other. A shutter

is fitted to the lens. Price 20s.

ERNEMANN "TINY" AND "STEREO-TINY" ROLL-FILM
CAMERAS.

(Sold by Charles Zimmermann and Co., Limited, 9 and 10, St. Mary-at-Hill, London, E.C.)

In the "Tiny" roll film camera the size of picture is $1\frac{1}{2} \times 2\frac{1}{2}$ ins., a No. 0 or 2-in. spool being used. The outside dimensions of the camera are only 6×3 ins., by a shade over $1\frac{1}{4}$ in. thick, but the little instrument is fitted with diaphragm shutter carrying the Ernemann double anastigmat, of f/6 aperture and $3\frac{1}{4}$ ins. focus, reversible brilliant finder and considerable rise of front, the lens-panel being locked by a spring at any point of its travel. There is also a cross front movement giving rise the landscape way of the plate. In the normal way all objects up to 10 ft. of

the camera are in focus, but the focussing scale provides for focusing within $4\frac{1}{2}$ ft. The camera is of excellent workmanship, and costs, as above described, 95s., or 50s. with the Ernemann "Aplanat" f/6.8. Although of such small size, the camera will

thus be seen to possess a full range of movements.

In the "Stereo-Tiny" a pair of lenses of 3 ins. focal length are provided, whilst each stereoscopic picture measures just under 13 in square. Complete with paired Ernemann "Aplanats" mounted in "Auto" shutters and adjusted to give one instantaneous speed in addition to time and bulb, focussing scale, and brilliant finder, the price is 80s. Like its single pattern; the "Stereo" is very strongly made.

THE ISOSTIGMAR VARIABLE PORTRAIT LENS, f/5.6.

(Made by R. and J. Beck, Limited, 68, Cornhill, London, E.C.)

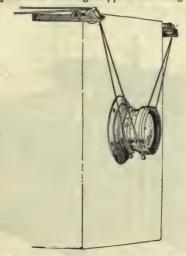
In this new series VI. of the Isostigmar anastigmats the makers have provided a feature of special importance to the professional portrait photographer—that is to say, an adjustment is supplied by which certain degrees of unsharpness can be introduced at will, and —what is perhaps most useful—repeated at will. Such a provision may often be employed to good advantage in portrait photography, and it is not too much to say that a good deal of the very best



portraiture has been done with lenses giving more or less diffused definition.

This, lens, when the special variable adjustment is not in use, behaves as a very well corrected anastigmat, and at full aperture we find the 9½-in. lens submitted to us covers a half-plate with surprisingly good definition. The adjustment provided is a variable separation between the front two lenses. By turning the lens-hood the separation is increased or diminished at will, and so varying

degrees of diffusion can be introduced. A scale is provided which enables us to record the amount of adjustment found to be desirable for particular purposes, and thus it is always possible to return to any particular degree of diffusion at will. The objective is well finished, the mount being brass, and the price is very moderate, £7 7s. for a $9\frac{1}{2}$ -in, lens working at f/5.6 not being out of the way.



The 12-in. lens costs £14, and the 17-in. £22. The hood-ring, and also the iris-ring, are so fitted that by a system of cords and pulleys the adjustments both of aperture and definition can be made from the back of the camera while focussing, and the prices include these fittings. For portraiture this should be a very useful lens, and the fact that it will also serve all the purposes of an anastigmat adds greatly to its value.

"NETTEL" FOCAL-PLANE CAMERAS.

(Sold by A. E. Staley and Co., 19, Thavies Inn, Holborn Circus, London, E.C.)

A number of most excellent features from the practical point of view are embodied in these cameras, of which we will describe the ordinary folding focal-plane, the self-capping "Nettel," and the "Stereax." In these cameras the focussing movement is done from the back through a system of levers which holds the front, this plan having the double advantage that the setting of the camera to any distance is under the eye of the worker, and, further, that the camera can be closed with the focus set for any given distance. On pulling out the front it is then at once ready for exposure, and we would emphasise here the convenient manner of extension, the

camera being simply pulled forward with one finger by the clip seen on the front in the drawing. Similarly, the camera is closed by first pressing on a stud on the back, at the same time pushing in the front. It is the most readily opened folding focal-plane camera that we know.



As regards other movements, it is fitted with double lens panel, rising and falling in each direction, with bushes for attachment to tripod, and with Iconometer direct finder. Focusing, as we have said, is done with the spindle pinion on the right hand just above the winding key of the shutter. This latter, in the ordinary model, is fitted with adjustable slit and spring tension, giving the widest range of speeds, whilst the shutter can be very quickly set to time, and then gives a very nice and gentle time exposure. The necessary readings of slit aperture and spring tension are very readily seen, the former through an aperture in the top of the camera, and the latter on the scale seen just below the winding-key in the figure. In addition, it has the convenient opening when focusing described in connection with the self-capping "Nettel." The convenient assemblage of all the working parts in one place is a feature of the camera, which, in the quarter-plate size, without dark-slides or lens, costs £5 10s.; in $3\frac{1}{2} \times 2\frac{1}{2}$ ins., £5.

In the self-capping pattern of "Nettel" these same features of convenient and rigid extension are preserved, as is also the facility of leaving the camera at a set focus. The shutter, however, is of the self-capping variety, and is, moreover, adjusted to give a range

of speed which it is uncommon to find provided by makers of focalplane shutters—namely, 1 sec., ½, ½, ½, sec., etc.—in addition to
time and bulb exposures. This is secured by a series of three
separate tensions of the spring, each used in conjunction with the
alterable width of the shutter-slit. The adjustment for width of
slit is made by pressing down the milled ring surrounding the
winding-key. A series of scales engraved on the disc between the
ring and winding-key gives the values for the different speeds,
among which, as we have said, are the very useful large fractions of
a second. Mention should be made of the convenient movement
whereby a full view of the plate is obtained, however the shutter
is set, simply by pressing down a lever on the right, when a turn
of the winding-key opens the blind to the full width of the plate.
On then releasing the shutter and re-winding, the act of an instant
only, the adjustment automatically falls out of action, and the
shutter can then be wound to whatever speed it is set to. This is a
most valuable movement, as it allows of very rapid inspection of
the focussing screen being made in the intervals of photographing a
series of pictures.

The camera has two-way rising and falling front, and, like the previous model, is very strongly made throughout. The price of the self-capping "Nettel" in $3\frac{1}{2} \times 2\frac{1}{2}$ size, without dark-slides or lens, is £6; in quarter-plate, £6 15s.; in postcard, £7 10s.; and in half-

plate, £8.

THE "MERITO" FILM TROUGH.

(Sold by W. L. Parkinson, Limited, 5, Commutation Row, Liverpool.)

In the new model of this apparatus the fixed bar under which the strip of roll-film had to be passed is made detachable, and falls into a bearing on either side of the dish, so that in commencing development it is only necessary to lay the roller on the film,



take up the two ends of the latter, and allow the roller to drop into its bearings in order to commence development. For developing roll-film in the dark-room so as to allow of separate exposures being watched during development the new model of the dish is a very convenient one. The prices are in quarter-plate size 2s., half-plate 3s. 6d.

THE "SIBYL" QUARTER-PLATE "SPECIAL" AND "DE LUXE" POCKET CAMERAS.

(Made by Newman and Guardia, Limited, 17 and 18, Rathbone Place, London, W.)

The "Sibyl" camera, first designed of the $3\frac{1}{2} \times 2\frac{1}{2}$ size in order to provide, in the minimum of space, a hand-camera of full range of movements, is now obtainable in quarter-plate size, in designing two new models of which size, the "Special" and the "De Luxe," the latter a double-extension instrument, the makers have provided facilities additional to those in the original model, now designated the "No. 5" (Tessar), and the "No. 6" (Cooke), in reference to the lenses they carry.

A series of "Sibyl" Special patterns is designed on the same lines as the Nos. 5 and 6—that is to say, the front is carried on lazy-tongs, and, on the baseboard being let down, runs out to its place almost by its own weight, requiring a touch to snap it into a position, which is most

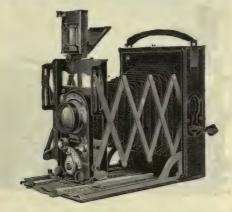


rigid. As in the $3\frac{1}{2} \times 2\frac{1}{2}$ size, the focus may be left set at any point from infinity to two yards, and the camera is obtained set at this same index when re-opened. In the present "Special" model two features are added to the focussing adjustments. In the first place a "depth scale" is provided, showing the area of correct focus for every stop of the lens, and, secondly, the focussing plate is provided with an adjustment for setting the focus either for plates (in single metal dark slides) or for films in a film pack. Lastly, the camera will take the large aperture lenses, the f/4.8, Goerz 1B "Celor" or the Zeiss f/4.5 Tessar, the former of 5 in. and the latter of 6 in. focal length. The other adjustments remain the same. The rise of front which, in the "Special," as in the Nos. 5 and 6 instruments, is provided for the upright plate only, is 1 in., the shutter has the range of speeds $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, 1-16, 1-32, 1-64,

1-100 second, and a direct-vision finder is fitted, which, as described below in the case of the "Sibyl de with mirror for use at a lower level. The whole instrument, in short, has the same practical features and perfection of mechanical construction as the first model, being made entirely in metal, leather-covered, with rounded corners and slipping into the pocket like a cigar case. Its outside dimensions are 6 ins. × 4½ ins. × 1½ in., and its weight just under 20 ozs. Its price, with the Georz lens, is £16 16s., or with the Zeiss, £17 17s.

In the case of the Nos. 8 and 9 "Special" patterns lenses of f/6.3 aperture are provided, and in these cameras rise both ways of the plate is available.

The double extension "De Luxe," or No. 1 model of the Sibyl, is not quickly described, since it contains several new features. The



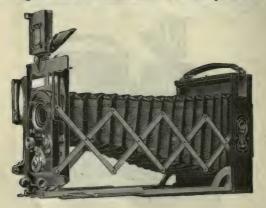
general type of construction is the same, the metal base, the rigid lazy-tongs extension. The focus plate as before is adjustable for both plates and films, and focussing scales for the whole and the half lens (long focus) provided to work with the same index, which, as in the "Specials," is provided with depth of field indicator. The front is brought into position somewhat differently. It is drawn forward by the pair of handles a little further than necessary, and caused to engage on the focus-plate by being pushed back. For the long extension all that is necessary is to release and pull forward the focus plate, when the same lines in the "De Luxe" on the side of the camera provides the adjustment for focus.

In the "De Luxe" pattern the front is made narrower, and is mounted so that in addition to the ample rise the upright way of the plate, both rise and fall, the landscape way is obtained; in each case equal to about one-quarter the dimension of the plate. The finder is very ingeniously contrived with a mirror at back of it, serving to

use the finder at a low level, while when using the camera at the eye level the mirror is turned out of the way. The lens frame of the finder is marked to indicate the subject, including both "upright" and "landscape" way of the plate, and with both long and normal focus. The finder also carries two levels, and further on being turned down neatly stows itself away on the camera front. The lens for which the No. 1 "De Luxe" Sibyl is adapted is the

The lens for which the No. 1 "De Luxe" Sibyl is adapted is the Zeiss Series VIIA., of f/6.3 aperture and 5 ins. focal length. This gives a long focus lens of 9 ins. when the back combination alone is used. Messrs. Newman and Guardia adopt the convenient bayonet joint method of securing the front combination, which thus can be instantly removed, and is put for the time being in a place provided for it in the back-frame of the camera.

One further novel and useful feature must be mentioned. In order to provide against the two disabilities of a loose tripod screw and the



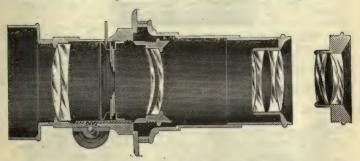
short bush of it which a light and compact camera entails, Messrs. Newman and Guardia secure the tripod screw permanently to the camera by means of a recessed metal shell, which is made to form part of the back body of the camera. The tripod head to receive the screw is either cut away or is provided with a key-hole-shaped aperture, through the large part of which the screw is introduced, slipped over into the constricted portion, and made fast with the nut. The arrangement accomplishes the desirable end of providing a quick attachment of the camera to the tripod, a thing which is all the more necessary in the case of the "De Luxe" Sübyl, which is as eminently fitted for use on stand as in the hand.

Although allowing the use of a 9-in. lens, the camera is very little larger than the "Special" pattern, but yet provides most conveniently a full range of movements, every one of which is embodied in workmanship which is the perfection of strength and ease. Complete, with Zeiss lens and six slides in case, the price is £21.

A DALLMEYER HAND-CAMERA TELEPHOTO COMBINA-TION.

(Made by J. H. Dallmeyer, Limited, 25, Newman Street, Oxford Street, London, W.

Messrs. Dallmeyer have just put up in a special light aluminium mount, with a view to the use of the lens for hand-camera photography, their 1A positive lens in conjunction with a 4-inch negative. This allows of a very considerable range of foci, and gives, for example, an equivalent focal-length of about 30 inches with a camera extension of just over 5 inches, and this at an aperture of



f/12, which is quite sufficient for a very large proportion of handcamera work. In addition, the user of this combination has the advantage of the use of the positive as a separate lens of f/4 aperture and focal-length 10 inches, the positive, moreover, having the adjustment of the separation of the elements of the back combination so that several degrees of diffused focus may be introduced when desired. The price of the whole lens, which as sent out by the makers measures 11 inches and projects just over 2 inches behind the lens flange, is £20 10s.

THE ROSS UNIVERSAL-STAGE ENLARGING LANTERN. (Made by Ross, Limited, 3, North Side, Clapham Common, S.W.)

In a new pattern of the well-known cantilever type of enlarger made by Messrs. Ross the negative carrier is pivoted on either side of the lantern so that the negative can be tilted out of its normal position at right angles to the axis of the lens, and thus lines which are "out" owing to the camera having been tilted at the time of making the exposure corrected in making the enlargement. This movement, a very essential one in an enlarger, is supplemented by rack and pinion adjustment of the negative carrier both up and down and sideways, so that the centring of the image in making the enlargement is most conveniently done. The stage is most excellently made in metal, the rack adjustments work very sweetly, and the stage is automatically fixed centrally when pushed into the enlarger.

THE STALEY COLLAPSIBLE TELEPHOTO HOOD.

(Sold by A. E. Staley and Co., 19, Thavies Inn, Holborn Circus, London, E.C.)

A most useful accessory for the telephoto worker is a hood for the lens which can be adjusted according to the angle of view being included by a telephoto lens. In this little hood the makers provide



a total length of 10 ins., and by making the tube in three portions they reduce its size when collapsed to less than 4 ins. by 13 in. diameter. The tube is excellently made in light metal fitted with threaded attachment at the rear end. The price is 15s.

THORNTON-PICKARD "UNEEKA" AND "ROYAL RUBY" ENLARGERS.

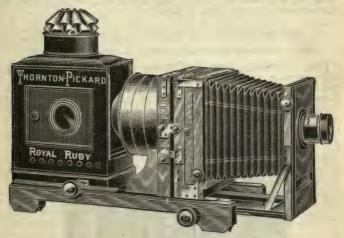
Made by the Thornton-Pickard Manufacturing Company, Limited, Altrinoham, Cheshire.)

The "Uneeka" fills a gap in enlargers, since it provides, at a moderate price, a lantern for the enlargement of $3\frac{1}{2} \times 2\frac{1}{2}$ negatives,



and is equally efficient when used for projecting ordinary lantern slides or for science demonstrations in the open stage afforded by

the removal of the bellows. It is fitted with $4\frac{1}{4}$ -in. condenser, mounted in a mahogany box, in which also is the negative or lantern slide stage, the box resting on the base of the lantern and secured in place by a screw inserted from below and readily withdrawn when it is required to polish the condensers. The stage allows of the central swing of the negative, rise-and-fall, and rotating movements, in each case by rack and pinion, whilst the negative may also be adjusted sideways. Although made primarily for the $3\frac{1}{2} \times 2\frac{1}{2}$ size, the lantern is fitted with negative carrier to hold a quarter-plate, part of which may thus be enlarged, whilst an inner carrier serves to hold the $2\cdot5/16\times1\frac{1}{4}$ negative, now coming largely into use in what we may call the "ultra-pocket" cameras. The carrier being removed, the stage takes the "Merito" lantern-slide carrier, and then serves equally well as a projection lantern,



whilst the ready removal of the bellows from its support at each end allows of pieces of scientific apparatus, troughs, etc., to be placed in the optical system. The apparatus is strong, but weight is removed from all portions where it fails to give strength, so that the lantern is surprisingly light. Complete with achromatic projection lens, lantern slide carrier and tray, but without light, the price is £5.

In the "Royal Ruby" the Thornton-Pickard Company have embodied many of the excellencies of their cameras in an enlarging apparatus, all the movements of which—and they include everything which an enlarger can be expected to do—are actuated by rack and pinion. Thus the lantern body, the three separate movements of the negative carrier (tilt, rise-and-fall, and rotatory), together with the rise and fall of the lens, are fitted with rack and pinion, the pinion

head in several instances serving also to lock the moving part. The lens front and the condenser frame are rigidly held by right-angled stays, whilst the bellows may be completely removed and the lantern used for optical and scientific projection. One excellent feature of the series is that the negative carrier of each lantern is built large enough to hold a negative of the next larger size; though the whole negative is not completely covered by the condenser, parts may nevertheless be enlarged. The price of the enlarger, complete with condenser and portrait objective, is £10 10s. in quarter-plate, £11 15s. in 5 × 4 and postcard, and £14 10s. in half-plate. The very convenient movements and excellent workmanship of the instrument deserve every commendation. A separate frame is provided to replace the negative carrier when the "Merito" lantern-slide carrier is being used. This, together with extra 4½ condenser and the slide carrier, costs 25s. in quarter-plate, 5 × 4, and postcard sizes, 30s. in half-plate.

THE VOIGTLANDER FOCAL-PLANE CAMERA.

(Made by Voigtländer and Sohn, 12, Charterhouse Street, London, E.C.)

The Voigtländer focal-plane shutter of beautiful workmanship and convenient design is embodied in this new edition to the Voigtländer hand-cameras, which, as shown in the drawing, is of the dropping baseboard pattern similar to the "Alpine" camera of the Brunswick firm which was fitted with a lens shutter. The new camera in the quarter-plate size gives an extension of 10½ ins., has



front of sufficient size to take the "Heliar" f.4.5 lens of 7 ins. focal length, the front having rise and cross movements. The camera is made throughout in metal, and the act of opening it throws down the baseboard and at the same time erects the finder. Of very substantial construction the camera is particularly fitted for use in tropical countries whilst the ready alteration of the shutter from instantaneous speeds to time and from one speed to another even while the shutter is set fits it for all kinds of photo-

graphy. The release is made either by trigger or "Antinous" attachment (detachable). Complete with three double book-form dark slides in ebonised wood with a novel description of eatch for the shutters, but without lens, the price is £16 10s.

THE VOIGTLANDER "DYNAR" LENSES FOR KODAKS.

(Made by Voigtländer and Sohn, 12, Charterhouse Street, London, E.C.)

For convenient fitting of the "Collinear" and "Dynar" lenses to Kodak and other cameras provided with diaphragm shutters Messrs. Voigtländer are now supplying the components of these lenses in separate cells ready for screwing into the shutters, thus the "Dynar" f/6 of 5 ins. focal length suitable for No. 3 Kodaks is supplied at £4, the "Collinear" III. f/6.8 at £5 5s. Similar lenses for the No. 3A F.P.K. are supplied at £4 15s. and £6 3s. respectively. In ordering these forms of Voigtländer lens mention should be made of the type of shutter for the camera being used—whether a black Kodak "Auto," bright Bausch and Lomb "Auto" or bright "T.B.I." shutter.

"EXCELSIOR" METAL TRIPODS.

(Sold by F. G. Phillips, 12, Charterhouse Street, London, E.C.)

Three patterns of very portable telescopic tripods are supplied under this name, each in a series of six or seven sizes, affording a total length of leg when fully extended of from 44 to 58 ins. The A pattern of extra strong type is composed of round brass tubes with an outer tube of black or nickel; the B pattern is similar, but somewhat lighter, whilst the C is fitted with aluminium tubes and is thus extremely light. In each case the tripod is fitted with double-spring catches lying loose in the tubes and, therefore, not liable to get broken off; moreover, the tubes engage only at the ends, so that they work very free when opening and closing; further the head of the tripod is reversible, one side being fitted with the English standard screw and the other with the Continental. The prices of these very portable and rigid tripods range from 7s. 6d. for an A pattern 44 ins. when extended to 18s. for a C pattern extending to 50 ins.

THE DALLMEYER PORTRAIT LENS MOUNT.

(Made by J. H. Dallmeyer, Limited, 25, Newman Street, Oxford Street, London, W

The latest form in which the renowned Dallmeyer portrait lenses are made is one which has been worked out within the past few months, and marks a very great advance as regards portability, lightness, and convenience in use over the original model provided with rack and pinion focusing, which may now be regarded as obsolete. Studio cameras being now fitted with all manner of focussing conveniences, the rack and pinion on the portrait lens is menely a relic of the days when a box form of fixed-focus camera was employed: it makes two separate tubes necessary, and thus

adds to the weight, bulk, and cost of the lens. Messrs. Dallmeyer, however, issue all their portrait lenses in a single tube provided with iris diaphragm, the perfectly circular aperture of which at all sizes calls for special mention. The chief element of novelty, therefore, in the new mount is the provision made for separating the two back elements of the lens in order to secure soft focus. This is done simply by turning the barrel of the lens, one half-turn being made for about the minimum degree of diffusion, one complete turn



for a further amount, and successive complete turns, up to a total of about four, for greater extremes of diffusion. This adjustment is provided by a suitable choice of right-handed and left-handed threads, so that it is impossible to unscrew the lens as a whole from the flange instead of making the adjustments for softness, and the result is secured without the aid of the looking bolts which represented an intermediate stage in the development of the Dallmeyer lens mount. All the portrait lenses now issued by Messrs. Dallmeyer are mounted in this convenient way.

THE $3\frac{1}{2} \times 2\frac{1}{2}$ N. AND G. REFLEX.

(Made by Newman and Guardia, Limited, 17 and 18, Rathbone Place, London, W.)

We note with some satisfaction that a $3\frac{1}{2} \times 2\frac{1}{2}$ model of the admirable "N. and G." reflex camera has been introduced. In the article in last year's "Almanac" on "Reflex Cameras" we commented on the many advantages of the $3\frac{1}{2} \times 2\frac{1}{2}$ size over the quarter-plate. As regards bulk, the new "N. and G." model measures $6 \times 6 \times 5$ ins., and is issued in all respects on the lines of the "N. and G." "Square-Reflector" reflex as at present made. This, we should explain, has been improved in some details during the past year. One important alteration is the introduction of a different pattern of hood. The more usual collapsible

hood held by a light metal strut is employed, the hood itself folding up and being covered when out of use by the hinged top of the camera to which is fixed a carrying strap. The ground glass



is thus fully protected, and the alteration does not affect the convenience with which the ground glass is rendered accessible for dusting or wiping. The base of the hood is fixed to a metal frame, which is instantly detached, as, in fact, is the complete hood, the upper portion being held to the inside of the hinged back

of the camera by a couple of studs sliding in slots.

In addition to this change, a release for the shutter, as also a focussing-pinion head, is provided on each side of the camera, and, further, a camera strap is provided on the side and top of the camera, the spring catch of the latter being of the full strength and

length necessary to hold the lid firmly.

As in previous models, the "N. and G." is free from projections, and the new model carries this good feature even to the point of making the two eyes to which is attached the carrying strap to fold down against the sides of the camera, and thus be secured from accidental damage. The only piece of mechanism which actually projects is the winding key of the shutter, and that is placed very securely in the angle formed by the camera back and the top of the rotating back, so that except an absolutely wilful blow be given it, it is practically safeguarded from damage.

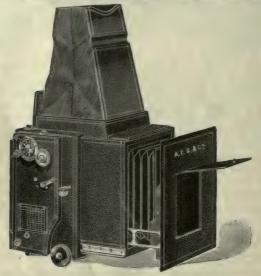
"ROYAL FOLDING" REFLEX AND "TROPICAL" REFLEX. (Sold by A. E. Staley and Company, 19, Thavies Inn. Holborn Circus. London, E.C.)

In the "Royal Folding" reflex Messrs. Staley supply a box form of camera, the instrument being built practically on the model of an ordinary reflex. The ground glass is mounted in a solid metal frame hinged at the back of the camera. The act of turning the

milled head seen on the front in both drawings first extends the camera front and then brings up the ground glass into position, the metal frame being held all the way round against a metal rebate,



so that its position should be accurate and invariable. When closing the camera, a stud on the other side is pressed—when turning of the same head first drops the ground glass and closes the



extension. This same movement also racks out the frame carrying the mirror, which, in the closed position, is folded back close against and parallel with the blind of the shutter. The dimensions of the quarter-plate camera when closed are just under $7\frac{1}{2} \times 7\frac{1}{2}$ ins. by 5 ins. thick. The total extension is $10\frac{1}{4}$ ins. from lens panel to plate, and the camera is provided with rise of front and spring lens screen, the whole front turning down to give access to the lens. The hood can be detached, but in the ordinary way is a fixture with the frame of the ground glass, and disappears into the inside of the camera when the instrument is closed. The focal-plane shutter is provided with outside adjustments for alteration of slit and spring tension, and works with great freedom from vibration both when giving time and instantaneous exposures. The camera will take lenses of 6 ins. focus and upwards, and the price complete with three double dark-slides, aluminium bound, but without lens, is £15.

In the "Tropical" model of the "Royal" reflex camera noticed in a previous "Almanac" the woodwork is of teak, dove-tailed throughout, and the shutter is worked at a single tension, speeds from 1-14 to 1-750 of a second being obtained by altering width of slit only, which is done from the outside. The camera is fitted with mask for the focussing screen, showing automatically the adjustment of the rotating back to landscape or upright, and is sold complete with three double slides, but without lens, at £15 5s. in quarter-plate size; £19 15s. in 5 × 4; and £22 5s. in postcard.

THE "AGFA" POCKET FLASHLAMP.

(Sold by Chas. Zimmermann and Co., 9 and 10, St. Mary-at-Hill, London, E.C.)

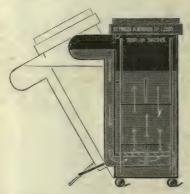
In this small flashlamp the makers have assuredly reached a point of convenience and efficacy beyond which it will be difficult to go. The lamp consists of a pair of trays of nickelled metal, which are hinged together and fixed to a metal handle some 7 ins. in length. In one of the trays the necessary quantity of flash-powder is placed. The novelty of the apparatus lies in the ingenious method of ignition. This is done by aid of a common Swedish safety-match, which is held by a spring-clip, so that its head comes in the semi-circular hole at the back of the flash-pan. The head of the match is ignited by the upward passage against it of a strip of striking-paper actuated by spring. The match in turn ignites the powder which is placed on it, and as the ignition takes place at the back of the pile of powder and against the metal back of the lamp, the flash is forced away from the operator. The actinic quality of the flash may be judged from the fact that at F.11, and using a plate about 200 H. and D., the use of 11 gms. of powder, say 20 grains, gave a well-exposed negative. lamp is not intended for big work by flash-powder, but for single portraits and exposures consuming up to about 40 grains of powder it is capable of giving very excellent results. Moreover, for architectural or similar technical work where it is desirable to use flashlight as an accessory means of illuminating extra dark corners, no more handy instrument than the "Agfa" lamp can be imagined.

It folds up flat for the pocket, and is got ready for use in a few seconds. Not the least notable feature of the lamp is its very moderate price, 1s. 9d., complete, with firing-papers and instructions.

THE "RYSTOS" CONDUIT DEVELOPING TANK.

(Made by Reynolds and Branson, Ltd., 14, Commercial Street, Leeds.)

In this tank the makers have embodied an ingenious way of providing the very necessary movement of the developer. From the upper part of the tank they build out a kind of weir communicating



by a tube on the outside with the bottom of the receptacle. Thus, when the tank is tilted into the outlined position, on the strut provided for the purpose, part of the solution flows over the weir and comes round again at the bottom, so that an occasional transference of the tank from one position to the other during development ensures the absence of markings caused by quiescent developer. The tank is very solidly made in copper, is fitted with rack and light-tight lid, and costs, in quarter-plate size for six plates, 9s.; or for twelve plates, 12s. It is made also in the $3\frac{1}{2} \times 2\frac{1}{2}$, 5×4 , postcard and half-plate sizes.

THE No. 1A "SPEED" KODAK.

(Made by Kodak, Limited, 57 to 61, Clerkenwell Road, London, E.C.)

This quite new type of Kodak is of the folding pattern, but includes a focal-plane shutter working very close to the sensitive film. The "Gradlex" multiple-slit type of shutter is adopted, the speed of the exposure being regulated by the width of slit selected, as well as by the spring tension. The two together give a range from 1-10 to 1,000 of a second. The shutter also allows of time

exposures. In giving a succession of exposures of equal duration it is necessary only to re-wind the shutter to the same point with a half-turn of the key. Direct-vision finder is provided with a mirror for use when holding the camera at a lower level, and the camera,



which takes $4\frac{1}{4} \times 2\frac{1}{2}$ pictures on the Kodak roll-film, is beautifully made with all the fittings in oxidised metal and covering of seal-grain leather. The price, without lens, is £8, with Goerz "Dagor" f/6.8 £13, or with Beck "Isostigmar" f/5.8 £10 12s.

THE 4A "SPEED" (FOCAL-PLANE) KODAK.

(Made by Kodak, Limited, 57 to 61, Clerkenwell Road, London, E.C.)

This instrument takes a picture $6\frac{1}{2} \times 4\frac{1}{4}$ inches, that is to say, it takes the Kolak daylight-loading spool of $4\frac{1}{4}$ inches of 6 or 4 exposures. As regards portability, the total outside bulk of the camera encloses both the roll-holder and the focal-plane shutter, but is very little bigger than would be either of these articles separate. Folded for carrying, the camera measures just under $12 \times 7 \times 3\frac{1}{2}$ inches. Extended, it allows of the lens panel being placed about $11\frac{1}{4}$ inches from the sensitive film. It will thus be seen that much success has attended the enleavour of the makers to provide a camera suitable for the most rapid exposures with n comparatively small bulk.

As regards the shutter itself, it is naturally of the self-capping type—any other would be useless for a film camera—with a single slit the width of which is very readily altered. An adjustable scale is provided with a pointer on the side of the camera. The pointer has only to be moved from one graduation into the next—it snaps at each point—to give a series of slit widths of \(\frac{1}{4}, \frac{1}{4}, \frac{1}{4}, 1, 1\frac{2}{4}, \text{ and 3}\)

inches, in addition to a much longer aperture the full height of the picture, or 64 inches, which is available only for time exposures. While the alteration in the width of slit is best made before the shutter is set, the other factor in obtaining the full range of speeds, the spring tension of the shutter, may be altered whilst the instrument is held ready for exposure with the shutter set. A complete turn of the winding-key increases the tension one number, whilst two pressures on a lever automatically relax tension to the same amount. The latter movement is an especially neat and convenient method of releasing the tension, far superior to that in the generality of shutters where one has to press the release with one finger and let down the tension-key with the thumb and finger of the other hand. The clutch release in the "Speed" Kodak allows of all this being conveniently done with one finger. The milled key provides a rapid wind of the shutter, whilst release is made by raising the plate provided with a small milled



knob, which is fitted with a spring, so that it must be intentionally raised to release the shutter. The adjustment for both time and instantaneous exposures are thus most conveniently made, whilst the conjunction of spring tension and slit-width allows of exposures being given from 1-5 to 1-1,000 sec., whilst with one single slit width—say 1½ inches—a series of exposures from 1-10 to 1-70 may be given by altering only the tension One point which we think is worthy of special mention is the closeness with which the blind of the shutter works to the plate or film. The distance in the case of the roll-film must be less than ½-inch, a point which deserves to be emphasised, since it is not unusual to find the efficiency of focal-plane shutters depreciated owing to their being mounted at some quite considerable distance from the true focal-plane.

In the way of other movements the camera is very well provided. It is fitted with direct-vision finder for pictures landscape way, the sighting point and lens of the finder both folding back by one move-

ment flat with its metal carrier. The lens front also carries a reversible brilliant finder, and is itself provided with screw rise and front movement. The front of the camera is brought forward and fixed in any point by the clamps seen in the illustration, a fine focussing movement thus serving for single adjustment of the pointer on the scale. Mention should also be made of the light-tight air vent provided in the front of the bellows, by means of which Irawing in of the blind of the shutter or the bellows is entirely obviated. Externally free from projections, except the one or two very solidly made keys on the left hand side, the camera is eminently fitted for the tourist, whilst its workmanship throughout is of a high mechanical quality, worthy of the Kodak reputation. The price of the No. 4a "Speed," without lens, is £10 10s. To it can be fitted any one of a number of high-class anastigmats of focus about 200 mm (about 8 inches). These include the Zeiss "Tessar," the Beck "Isostigmar," the Goerz Series III., and Goerz "Celor" f/4.8. The camera can also be fitted with a plate adapter, focussing screen, and one double plate-holder, at a cost of £1 10s.

THE KODAK "BALL-BEARING" SHUTTER.

(Made by Kodak, Limited, 57 to 61, Clerkenwell Road, London, E.C.)

This new shutter, which is now fitted to all the No. 3, 3A, and 4 "F.P.K." cameras, represents a new pattern of shutter, the leaves being made in five segments, mounted on ball-bearings, and opening in the shape of a star, an arrangement which gives a high efficiency. The exposure, both for time, bulb, and the three adjustable speeds of 1-25, 1-50, and 1-100 secs., is given either by trigger or pneumatic



release, and with the extreme of smoothness and silence. Moreover, the shutter is fitted with an automatic counter recording, up to a total of twelve, the number of the exposures. This counter can be brought back again to No. 1 in an instant by means of the little ratchet wheel attached to it. The automatic record thus made of each exposure should be a further convenience to the user of roll-film, whilst the construction of the shutter impresses us by its freedom from mechanical complications.

THE "EUXIT" POCKET CAMERA.

(Made by J. F. Shew and Co., 88, Newman Street, Oxford Street, London, W.)

Pronounced "Use It" in reference to its response to all kinds of practical requirements, this new pocket camera is an addition to the large family of "Xit" cameras made for many years past by Messrs. Shew, and rightly esteemed for their working qualities. The "Euxit" embodies the same system of side flaps employed in other models of the "Xit" cameras. It is made to take a plate $3\frac{1}{2} \times 2\frac{1}{2}$ ins., being fitted with a Cooke focusing lens of 4-4 inches focal length mounted in the well-known "Compound" shutter. The lens mount thus provides the necessary focusing for objects within 9 feet of the camera, and the lens itself affords a risk of one inch the landscape way of the plate, together with a cross front movement which is available as rise when the camera is held the upright way of the plate. The finder is of the "Icono





meter" type, a sliding rod being used in conjunction with a wire frame on the lens front. This very simple device has the further advantage that the frame moves up along with the lens, and therefore gives some idea of the amount of picture included on the plate, provided that care is taken to hold the camera level. The "Euxit" is fitted with focussing screen which instantly clamps into the back of the camera, and with six single metal dark-slides which are similarly placed quickly in position. The apparatus is very strongly made in mahogany, aluminium bound, and is an actual pocket instrument, the total dimensions of the camera with dark-slide ready for exposure being $4\frac{3}{4} \times 3\frac{3}{6} \times 1$ 3-5 ins. The price complete with the Cooke lens, series III. f/6.5, and with purse for the six metal slides, is £9 9s. In quarter-plate size and with Cooke lens of 5-in. focus the price is £11 11s. The instrument is strongly made, and may be recommended for withstanding a great deal of hard usage. It should be added that it is fitted with bushes for attachment to a tripod.

THE ROSS NEW MODEL ARC-LAMP.

(Made by Ross, Limited, 3, North Side, Clapham Common, S.W.)

Many people who associate the name of Ross only with the manufacture of high-grade optical instruments may not perhaps be aware of the many mechanical instruments other than optical made in the Clapham factories. The new model of arc-lamp just intro-

duced is mechanically a beautiful piece of work, whilst its technical qualities are those which should appeal very strongly to the lanternist and enlarger. The lamp is made throughout in brass, the carbons amply insulated, and very nice adjustment provided for raising and lowering the arc as a whole, adjusting the separation between the carbons, and for moving the upper carbon to and fro. In addition to this the lamp allows of a sideway adjustment of the light, all the movements working with excellent freedom from back-lash so that the light is very rapidly manipulated in use. The lamp can be detached from its own base and transferred to a lantern tray of the ordinary type, it being thus suitable for use in any make of lantern

THE NEW MODEL "TAXIPHOTE."

(Made by Jules Richard, 23A, Albemarle Street, Piccadilly, London, W.)

Since we reviewed the universal model of the "Taxiphote," serving not only as a viewing instrument for stereo Verascope transparencies, but also for projection and printing purposes, this simplified model of the apparatus has been placed on the market. It accommodates twenty-five Verascope stereo transparencies which are brought up one by one before the pair of viewing lenses simply by turning the handle seen on the right in the illustration. In this way the observer can look at the whole series without taking his eyes from the instrument. The "Taxiphote," however, allows of



any one transparency being picked out and raised for observation on first turning a pointer on the left of the cabinet to the number required. The instrument is provided with adjustment for the separation of the eye-pieces and with focusing movement. Complete with lock and key for the cabinet and one storage box holding 25 positives the price is £7 5s., or without adjustable separation of the eye-pieces £6 6s.

Mention may also be made of the latest model of the "Verascope" camera itself to which Zeiss "Tessar" lenses of f/4.5 aperture are now fitted, as is also a new type of shutter giving instantaneous exposures from $\frac{1}{5}$ to 1-150 sec. in addition to "time." The makers

issue a speed card for each camera, giving the actual speeds which have been found for that particular shutter. The "Verascope" may also be fitted with an adapter to take the daylight-loading film-pack.

"COOKE" SERIES IIA. f/3.5 PORTRAIT LENS.

(Made by Taylor, Taylor, and Hobson, Limited, Stoughton Street, Leicester.)

This new addition to the series of "Cooke" lenses applies the well-known construction adopted in these objectives to the production of a portrait lens of the very highest aperture—namely, 1/3.5. The lens is made only in one focal length—namely, 12 ins.—intended for making cabinet portraits, and at full aperture it covers the half-plate perfectly. A lens of this large aperture and focal length is necessarily of considerable size, the glass being nearly 3½ ins. in diameter, and the outside diameter of the flange measuring 5¼ ins. The lens is supplied with iris diaphragm, whilst the front portion is capable of being separated from the back elements so as to give a certain amount of diffusion, the makers providing an automatic stop when reverting to the sharpest possible definition. The price of this new "Cooke" is £18.

THE "MERITO" DEVELOPING DISH.

(Sold by W. L. Parkinson, Limited, 5, Commutation Row, Liverpool.)

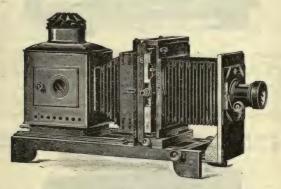
Still another variant of the numerous types of developing dish, but one which has much to recommend it from a practical point of view, is the pattern just introduced by Messrs. Parkinson at the prices of 7d. in quarter-plate size and 1s. in half-plate. The dish is provided with two ribs on its lower side about half an inch apart, so that whilst it stands quite level on these a gentle rocking motion can be given to it simply by touching either end of the dish. The dish is also provided with two circular depressions at opposite corners of the inside, serving to facilitate the raising of the plate with the fingers. The material is a china of very fine structure and enamel surface.

THE No. 6 AND "POPULAR" ENLARGING LANTERNS.

(Made by the Midland Camera Company, Slaney Street, Birmingham.)

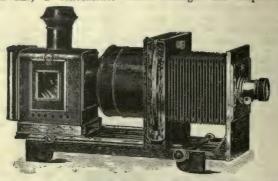
We could fill several pages of these notices with descriptions of the many patterns of enlarger made by the Midland Camera Co., who have specialised with great success in this type of apparatus, of which they make no less than nine distinct models representing a series of thirty-four different enlargers. We select two models, the "No. 6"—perhaps the most popular all-round type—whilst the "Popular" or "No. 3" is a less expensive pattern, which nevertheless is remarkable value for the price charged for it. In the No. 6 the first point to be specially commended is the universal

negative carrier-frame. A rack and pinion adjustment at the foot gives the negative a tilt across the axis of the lens, so that lines which are "out" in the negative due to the camera having been tilted at the time of making the exposure may be corrected, such tilt of the negative being absolutely necessary in addition to an equal tilt of the enlarging easel. We mention this, as the contrary is often stated, but omission to tilt the negative leads to a disagreeable "squat" distortion in the enlargement. In addition to this the frame allows of three other rack and pinion movements being given to the negative—namely, vertically up and down, sideways, and rotary, so that the correct adjustment of the picture on the enlarging easel is most easily and rapidly done, particularly as all three heads of these pinions are placed together in a bunch, although each is quite separate in its action from the other two. Indicators are provided, so that it is seen when the negative is centrally placed as regards any of these movements, and the



carrier as a whole snaps centrally into the stage from whichever side of the enlarger it is inserted. Further, mention should be made of the spring adjustment by which the negative is inserted in the carrier. A pair of springs press the film side into register with the top plate, so that when focussing has once been made for a given scale of enlargement every subsequent exposure will be in sharp focus owing to the film being in correct register, while at the same time the negatives may, if desired, be quickly taken in and out by removing the bellows instead of by taking out the carrier. In other respects the enlarger is conveniently arranged, the focussing heads are placed on each side so that the operator can work just as well on one side as the other. The lantern has also a screw adjustment from the back, the bellows are detachable, and the whole apparatus very excellently made in oak at a price in quarter-plate size, with 5½-in. condenser, for £8 10s., without lens; in half-plate, with 8½-in. condenser, for £8 10s.

In the "No. 3" pattern the lantern has rack and pinion adjustment, as also the central tilt for the correction of distortion, whilst there is also provided sufficient extension to allow of reduction to lantern size, a convenience which enlarges the scope of the

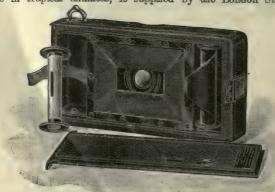


apparatus. As before, there are automatic indicators for showing the degree of swing or tilt, and the apparatus costs, in quarter-plate size with 5½-in. condenser, £3 5s. without lens; in half-plate size £5 15s.

THE "PARVEX" FOLDING FILM CAMERA.

(Sold by the London Stereoscopic Company, Ltd., 106 and 108, Regent Street, London, W.)

A very portable pocket film camera, specially manufactured for use in tropical climates, is supplied by the London Stereoscopic

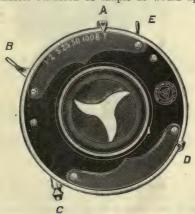


Company under this name. The body is made of special hard black pearwood, the metal bed of the camera and the sides being all in one piece. The edges of this metal plate are locked into the body, so that a very solid construction is secured and the film is most efficiently protected from damp whilst in the camera. The "Parvex" takes a picture of $3\frac{1}{4} \times 2\frac{1}{4}$, employing a $2\frac{1}{4}$ film spool. It is fitted with a nickelled lazy-tongs extension for the front, and carries an instantaneous shutter, the working parts of which are enclosed. Time, bulb, and instantaneous exposures are very readily given, the latter being set simply by turning the milled screw above the lens. The camera is also fitted with sunk brilliant finders for upright and horizontal pictures, in addition to a directvision finder, of advantage when making an exposure at the level of the eye. Throughout the makers have very fully considered resistance to the wear and tear inevitable when a camera is used abroad, the bellows, for example, being made of Russian leather, secured not by any cement, but by metal plates at each end. The camera is usually fitted with a "Cooke" focussing lens, and thus allows of being set to various distances; but, depth of focus in an f/6 lens of 4-in. focus being so considerable, actual focussing may in most cases be dispensed with. The "Parvex" is sent out ready for use in a stout leather sling case, with look and key and carrying strap.

THE NEW MODEL (1909) "AUTOMAT" SHUTTER.

(Made by the Bausch and Lomb Optical Company, 19, Thavies Inn, Holborn Circus, London, E.C.)

In this new model of the universally used "Automat" shutter the working parts are most thoroughly enclosed, and the adjustment of the shutter rendered as simple as would appear possible.



As shown in the drawing, B is the release lever, serving for both instantaneous, bulb, and time exposures, whilst C is the connection for pneumatic or "Antimous" release. E is a locking lever, shown

in the drawing released, but, when depressed, serving to bolt the shutter so that accidental exposure by pressure on the ball when closing the camera or by strangers tampering with the apparatus is obviated. The sliding pointer A servies to alter the adjustment of the shutter from time to bulb and thence through the series of exposures marked on the scale. The remaining adjustment, that of the diaphragm aperture, is provided by the pointer D, the scale on the lower rim of the shutter being left blank for the engraving of the diaphragm numbers. The price of the shutter in its latest form for quarter-plate and 5×4 cameras is 21s.

As regards the marking of speeds on the shutter the Bausch and Lomb Co, in their circular state that "the maximum speed is between the 1-50th to 1-60th of a second, and is the quickest of any shutters at present offered in competition. We continue to mark the speeds from 1 to 1-100 second, as is the custom of the trade, and must continue to do so until the public realise that none of the cheap shutters will give this speed, when we will gladly adopt our own

system of marking actual speeds."

THE "COMPOUND" SHUTTER (NEW MODEL).

Sold by A. E. Staley and Co., 19, Thavies Inn, Holborn Circus, London, E.C.)

In the latest pattern of this most perfect of diaphragm shutter the setting of the shutter to bulb or time automatically



looks the setting lever used only for the instantaneous speeds, leaving simply the release free. This latter works very nicely indeed both for bulb and time. On setting the adjusting knob to "instantaneous," the setting lever is then brought into action.

The shutter in this form is as convenient as can be made, and its high efficiency, even at the top speeds, makes it a piece of apparatus on which the hand camera worker may depend for the fullest degree of exposure. The prices of the "Compound" in its latest form remain the same.

THE TROFICAL "PANROS" FOLDING FOCAL-PLANE CAMERA.

(Made by Ross, Limited, 3, North Side, Clapham Common, London, S.W.)

The ordinary model of this folding camera, fitted with the very convenient focal-plane shutter reviewed in last year's "Almanac," is now obtainable as a tropical pattern, constructed of teak and costing, complete with Homocentric lens f/6.3, three double dark slides, and leather case, £16 17s. 6d. in quarter-plate size; £18 10s. in 5×4 ; and £19 15s. in postcard size. As in the



ordinary model, the shutter is self-capping, of rapid work, with the highly convenient adjustment of speed simply by turning the inner key seen in the drawing, and, finally, similarly quick movements for "time" and "bulb" exposures and for focusing on the ground glass. The ordinary model of the "Panros" is now made in postcard size. Price, with f/6.3 "Homocentric" of $6\frac{1}{2}$ focus, three double backs, and black leather case, £14 10s.

"ROSS" TELEPHOTO ATTACHMENTS.

(Made by Ross, Limited, 3, North Side, Clapham Common, London.)

This is a very prefectly finished telephoto lens mount, the one submitted to us being fitted with 7-inch Homocentric positive of f/6·3 aperture, and two negatives of 3 and 2½ inches focus respectively. These settings are made in several sizes, to suit various positive and negative lenses, and are fitted with focusing rack and pinion, and a scale showing the separation of the optical elements, while another scale is engraved on the complete instrument to show

the approximate magnification. The complete objective is less bulky than many telephoto combinations of the ordinary type, and is highly convenient in use. The mechanical perfection of the mountings calls for special commendation. Any first-class ana-



stigmat can be used as the positive element, the Homocentric being specially recommended. The prices of the settings vary from £2 10s. to £5 5s., while the negative elements cost from £1 15s. to £7 15s. Thus the Ross series provides for the use of tele-negatives from 1½ to 5 ins. focus.

THE "CHALLENGE" CELTIC HAND CAMERA.

(Made by J. Lizars, 101 and 107, Buchanan Street, Glasgow).

This new model of the "Challenge" series is a highly portable camera, fitted with adapter (which is a fixture) for the envelope daylight-changing system. Although a double-extension instrument giving over 9 ins. from lens to plate, the outside dimensions of the camera when closed are under $2\frac{1}{2} \times 5\frac{3}{4} \times 4\frac{1}{2}$ ins. The camera front pulls out automatically into focus on infinity, and is then racked out direct to the full extension. The front is also provided with large rise and cross-front movement, and carries a Beck R.R. lens mounted in the "Ibso" or Bausch and Lomb automatic shutter. The ground glass and a very deep and efficient focusing hood being included in the camera, the instrument has the virtue of freedom from all loose parts, and is, moreover, excellently made in mahogany with brass fittings. The price is £3 12s. 6d.

THE "FALLOWFLEX" REFLEX CAMERA.

(Sold by J. Fallowfield, 146, Charing Cress Road, London, W.)

This camera is fitted with the Whitehead or "Pyket" focal-plane shutter reviewed in last year's "Almanac," its characteristic feature being the very rapid wind and adjustment to the series of slit widths. The winding key both sets the shutter and serves for the adjustment of the width of the blind, and this by a very rapid movement. Also the shutter is self-capping, and the plate is thus doubly safeguarded from light—by the blind and the mirror, which latter automatically falls after each exposure. The camera is we'l

provided as regards extension, which is nearly 12 ins. in the quarter-plate size, whilst, on the other hand, the "dodging" movement of the mirror allows of a lens as short in focus as $4\frac{3}{4}$ ins. being employed. The rise of front is a full inch, and is fitted with rack and pinion, whilst the front also carries lens-shade, serving also as a cap for time exposures. The hood erects itself on raising the lid of the camera, whilst the frame of the hood is hinged, and gives



access immediately to the mirror. The rotating back may be said to complete the list of good features of the "Fallowflex," which is very strongly made and well finished in black ebonised wood and black grain covering. The price of the ordinary model, complete with 3 slides, is £9 9s. At the above very moderate price the "Fallowflex" certainly takes a place by itself among reflex cameras. A tropical model in teak, brass bound, is also made.

THE WATKINS DAYLIGHT TIME TANK

(Made by the Watkins Meter Company, Hereford.)

Several new and commendable features are embodied in this piece of apparatus. These apply quite as forcibly when the tank is employed for development by inspection of the negatives instead of when the instrument is used for the specific purpose for which it is made—namely, development by time only. In the first place, the

rack, which holds a dozen plates, is made one with the cover of the tank, the racking being mounted in it so that the plates are held horizontally, not vertically, in the solution. The advantage of this arrangement is that when only one or two plates are to be developed they may be placed in the lower grooves, and thus a small quantity of developer only is needed. The delivery piece of the tank which projects from one end serves only for admission and discharge of the developer, but also accommodates a thermometer, which serves to check the temperature of the solution. The tank is very substantially made,





Fig. 2

and, if care is taken to rinse it out and set it to drain after each time of use, will last for a long time, but it should not be forgotten that, like any other metal dish, if allowed to stand is a damp place, where any last traces of water will not dry up in it, its life will be considerably shortened. The arrangements of the rack make it very easy, we find, to load plates into it even in the dark, the edge of the empty rack, and afterwards the edge of each plate, serving as a guide for the insertion of the next. The price of the tank in the quarter-plate size is 5s.; it is also made in the half-plate size, holding 36 ozs. of developer.

THE "MOTO" DARK-ROOM LAMP.

(Sold by W. Butcher and Sons, Limited, Camera House, Farringdon Avenue, London, E.C.)

This new pattern of dark-room lamp, very strongly built, somewhat on the design of a motor-car lamp, is made entirely of metal, the reservoir, which carries a good size burner, being outside, and the lamp being provided with two circular safelights (ruby and amber) 34 inches in diameter, either or both of which may be used. One good feature of the lamp is the large handle, enabling it to be conveniently carried about the dark-room.

NEW "PREMO" CAMERAS.

(Made by Kodak, Limited, 57 to 61, Clerkenwell Road, London, E.C.)

Of the series of cameras taking the all-convenient "Premo" filmpack, a new size and pattern is the "Premo Junior" for pictures 34 × 24 ins., a neat box camera measuring 53 × 44 × 34 ins., of fixed focus type with everset shutter for time and one instantaneous speed, three diaphragms, two sunk ground-glass finders, and sockets for the tripod screw. The price is 12s. 6d.



New folding cameras for the "Premo" film-pack are the Nos. 1A ordinary and "Special" "Premoettes." The "Special" takes a picture $4\frac{1}{4} \times 2\frac{1}{2}$, is fitted with scale focussing, R.R. lens with iris diaphragm and everset shutter fitted to work at time, bulb, and one instantaneous speed, and with trigger and pneumatic release. It carries also reversible shaded brilliant finder and tripod bushes. The price is 52s. 6d. The "Ordinary" pattern is similar in design to the "Special," but is fitted with a single lens, and ground-glass finder. The price in this case is 25s. All three cameras are excellently and strongly made, and are capital instruments to put in the hands of a beginner.

NEW "BROWNIE" KODAKS.

(Made by Kodak, Limited, 57 to 61, Clerkenwell Road, London, E.C.)

In the No. 3 "Brownie" Kodak, a fixed focus box hand-camera of quarter-plate size for roll-film only, the lens is fitted with ever-set shutter for time and instantaneous exposures, the former obtained by pulling up the small nickelled lever on the front. Three diaphragms are provided, there is ground-glass finder each way of the plate, and the camera also carries two stout bushes for attachment to the tripod. Covered in leatherette, with all fittings nickled, the price of the camera is 17s. 6d.

Two new folding "Brownies," Nos. 3 and 3A, also for roll-film, are introduced as new models, both fitted with the Kodak automatic shutter, with time, bulb, and one instantaneous speed, and with the very convenient and practical automatic focusing lock, by which the camera can be set to any point on the focussing scale from 6 ft. to infinity, the front then locking at the set point on being pulled out on its runners. Each camera is fitted with reversible ground-glass finder and two tripod sockets. The price of the No. 3,

taking quarter-plate pictures, is 37s. 6d., or with R.R. lens, 46s. The No. 3a, which is postcard size, is priced at £2 2s., or £2 10s. with R.R. lens.



Both cameras when closed for carrying are of very convenient slim dimensions, and both in every detail are of the characteristic excellent Eastman workmanship.

THE DALLMEYER TRIPOD SUPPORT.

Made by J. H. Dallmeyer, Limited, 25, Newman Street, Oxford Street, London, W.

An accessory for the service of the architectural photographer is issued under this name by Messrs. Dallmeyer, and takes the form of the old device of three radiating struts on which the points of the tripod can be placed, thus preventing the legs from slipping, as they otherwise would, on a stone or polished wood floor. The particular virtue of the present accessory lies in the extra portability given to it by dispensing entirely with a centre piece for the struts, hinging them together direct, so that when spread out and bolted at the centre they form a three-way support for the tripod. Thus when folded the whole accessory measures over all only 25 × 23 × ½ ins., and can thus be strapped up with the photographer's ordinary tripod without appreciably increasing the bulk of the latter. For architectural work this little accessory, which costs 7s. 6d., should be a valuable addition to the photographer's kit.

BUSCH FOLDING FOCAL-PLANE CAMERAS.

(Made by the Emil Busch Optical Company, 35, Charles Street, Hatton Garden, London, E.C.)

Two new models of the convenient folding focal-plane camera have been placed or the market by the Busch Co., the first, the "Planor," being a further improvement of the camera hitherto marketed under the tenamera. The lens-board is most rigidly supported by four stout metal struts, each hinged half-way between front and back and giving the highest degree of rigidity to the front board. The camera is very easily and quickly collapsed

by simple pressure on the hinges. It is quickly opened simply by pulling out the pair of clips seen on either side of the lens in the drawing. The camera is fitted with two-way rising front, giving both a rise and fall of 1 in. the vertical way of the plate in addition to rise and fall the landscape way of the plates. The shutter is very simple and rapid in its manipulation, the slit being adjusted by winding the blind until the upper part of the aperture is level with the top of the plate, when pressure of a knob on the left of the camera allows of the slit being enlarged or contracted by winding a small head on the right just above the winding key. The adjustment for alteration of tension is provided in the usual way, the two in conjunction giving speeds up to 1-1,000 sec. Time exposures are very

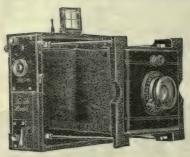


simply obtained by opening the slit to the full width of the plate, when pressure on the release opens the shutter and a second pressure closes it. Mention should also be made of the brake attachment for the shutter, convenient at times for still further slowing down the slowest speeds given by the shutter. In several points the details of construction make for convenience. For example, the catch for the dark-slide or focussing screen is operated by pressing down the lever instead of raising it, an improvement which, although of minor importance, nevertheless conduces to smoothness of working. The camera is provided with strong bushes for adjustment to the tripod, and complete with three excellent double plate-holders with pull-out shutters and Busch "Detective" Aplanat the price is \$8 10s. 6d. With "Omnar" anastigmat, Series III., No. 2B, the price is £9 10s. The camera can also be adapted to carry the

"Premo" film-pack at the price of 12s., whilst extra double plate-

holders are obtainable at 10s. each.

The "Heda" is a still cheaper variety of the camera sold at the low price, complete with three single metal slides and Busch Aplanat f/8, of £5 7s. 6d. The extension in this case is provided by four metal rods, and certainly gives a very rigid front board. Rise and fall of front are provided the vertical way of the plate, whilst the lens-board is further made rotatable, so that the rise and fall can be obtained either way of the plate. The shutter, with the exception

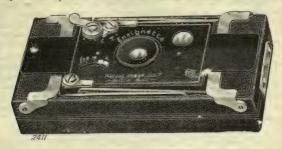


of the brake attachment, is the same as that fitted to the "Planor." Adjustments of the width of the slit and for time exposures are made as with the "Planor," and the "Heda," like the "Planor," is also fitted with direct-vision finder. The cameras, both of which are listed at present only in the quarter-plate size, are most efficient instruments of their type, and may be recommended for the many descriptions of hand-camera photography, particularly that of rapidly moving objects.

THE "ENSIGNETTE" VEST-POCKET FOLDING CAMERA.

(Made by Houghtons, Limited, 88 and 89, High Holborn, London, W.C.) A complete self-contained roll-film camera which measures under 4×2 ins. and is scarcely more than $\frac{3}{4}$ in. in thickness is what Messrs. Houghtons have achieved in this instrument, which, fitted with a single lens, is issued at the moderate price of 30s. The camera takes a picture $2\frac{1}{4}\times 1\frac{1}{2}$, the roll-holder accommodating a spool of six exposures. The little instrument is fitted with a time and instantaneous shutter, a brilliant view-finder, and a rotating diaphragm plate, giving the apertures f/11, f/16, and f/22. Although designed primarily for use in the hand—the short focal length of the lens dispenses with the need of focusing and allows of objects up to 7 ft. distant being photographed—the camera can be stood on a flat surface, both for vertical pictures or those landscape way of the plate, for which latter purpose a small folding leg is attached. The instrument is made throughout in metal, and is strongly though lightly constructed. While it is a perfectly practical instrument, giving negatives which will stand a considerable degree of enlarge-

ment, the astonishing fact remains that it can be carried without inconvenience in the upper waistcoat pocket, in connection with which fact it must be remembered that it is a complete instrument, and has only to be opened out on its nickelled struts to be ready for



taking a picture. The camera may also be had with an "Ensign" anastigmat lens working at f/5.6 for 70s., whilst a fixed focus enlarger, giving a postcard picture from the "Ensignette" negative, is supplied for 5s. 6d.

"ENSIGN" BOX-FORM FILM CAMERAS.

(Made by Houghtons, Limited, 88 and 89, High Holborn, London, W.C.)

A new series of the convenient and saleable box-form of film camera has been designed and placed on the market by Messrs.



Houghtons to provide a series of cameras which, from first to last, is of substantial British make. These box-form "Ensigns" are

made in three sizes—the $2\frac{1}{4}$ A for pictures $2\frac{1}{4}$ \times $2\frac{1}{4}$ ins., the $2\frac{1}{4}$ B for pictures $3\frac{1}{4} \times 2\frac{1}{2}$ ins., and the $2\frac{1}{2}$ for pictures $4\frac{1}{2} \times 2\frac{1}{2}$ ins., whilst there is also a quarter-plate size. The cameras are very substantially built of hard wood, the film-holding chamber being removable from the side of the camera, thus providing easy access for reloading, but being firmly locked by a spring and two separate catches. The fittings include a single achromatic lens, "everset" shutter, giving time and instantaneous exposures, two ground-glass view-finders, and leather handle for carrying. The 24 B and the 24 sizes are further provided with adjustable diaphragm plates, giving apertures from f/11 to f/32. The substantial make and good appearance of the instruments are quite what one would expect from camera makers of the experience of Messrs. Houghtons, and the new series should find purchasers in all parts of the globe, both for the cameras and for the "Ensign" film used in them. The prices of the three sizes named above are 5s., 10s., and 12s. 6d.

THE "MIRAL" DISAPPEARING-MIRROR REFLEX CAMERA.

(Sold by Fred V. A Lloyd, Limited, 15, Lord Street, Liverpool.)

This model of the "Miral" series of reflex cameras made by Talbot and Eamer Mirals, Limited, has one special feature particularly recommending it for sports and other branches of press



photography in which there is rapid motion. By turning a pointer on the right of the camera to "T," and setting mirror and shutter in the usual way for a rapid exposure, the object may be watched on the focussing screen to a point just a little short of what is

required in the negative before pressing on the release lever. With the camera adjusted as just described, pressure on the release allows the mirror to move up, but the shutter is not released until the finger is taken off the lever. The movement thus enables the photographer to follow instantaneously with his exposure the action of the subject, which latter at the final instant he views direct. This is quite in accord with the best practice of press photographers, and is certainly a most useful movement. In other respects this model of reflex is well provided with ample rise of front, lensshade, rotating back, accessible focussing screen and mirror, and focal-plane shutter very readily adjusted to the various speeds, and for time exposures. It is fitted with level in a convenient position, and is of thoroughly good workmanship. It is supplied with Goerz anastigmat, f/6·8 aperture, and three double dark slides at £16 15s.

THE "BUSCH" REFLEX CAMERA.

(Made by the Emil Busch Optical Company, 35, Charles Street, Hatton Garden, London, E.C.)

To the large series of hand cameras included among the manufactures of the Emil Busch Optical Company must now be added an instrument of the reflex type. In its general construction the



"Busch" reflex resembles the type of instrument which has been evolved during the last year or two—namely, one to which most of the cameras on the market more or less closely conform. It has, however, one or two special features. In the first place, the panel

carrying the lens is of unusual size—namely, 31 ins. square—and therefore able to carry lenses of the largest aperture, or even a lens of the portrait type. The panel is made so that it may be reversed in its setting, and the front of the camera has considerable rise and fall movement, a total range of over an inch in the 31 by 21 size, which is distributed partly as rise and partly as fall. It is evident that the carrying of a large lens is particularly kept in view by the makers, since the extension struts of the camera are four in number. very rigidly made, and hold the lens front very firmly. focussing pinion is placed on the left-hand side of the camera, whilst on the right a clamping head is provided, so that, if necessary, the camera may be fixed at a focus for any given distance. The hood is built square, and gives a perfectly unobstructed view of the corners of the plate. The frame to which it is fixed is hinged on the front side, and is instantly turned back, giving access to the ground glass, which latter can also be turned up to allow of the mirror being dusted. The mirror itself is depressed by pressure on the lever seen in the top right-hand corner of the camera in the drawing, but is protected by a guard (not shown in the illustration), serving to prevent accidental damage. The shutter release is actuated by a similar lever on the right-hand side of the camera, the release of the mirror and shutter being extremely free from vibra-The focal-plane shutter is that noticed elsewhere under the Busch Planor focal-plane camera. The camera is also provided with the indispensable rotating back, which snaps into each position. In workmanship the camera is altogether excellent, being finished throughout in black ebonised wood, covered in black leather, and having all the metal parts also of black finish. The camera is made in three sizes only-namely, 31 by 21, 41 by 31, and 51 by 31 (postcard). In the quarter-plate size the price, complete with three plateholders and Busch "Aplanat," f/6.5, is £13 10s.; or with Busch "Omnar," f/4.5, £17 8s. In the 3½ by 2½ size these prices are £12 and £15, whilst in postcard the price, with f/4.5 "Omnar," is £21 10s. The cameras allow of extensions of 8, $10\frac{3}{4}$, and $12\frac{3}{4}$ ins. respectively, in the three sizes, and, therefore, while allowing of quite a narrow angle of picture, such as that given by the single combination of the lens, are eminently suited for use with the wellknown "Bis Telar" telephoto lens. The instruments are also applicable for use with the "Premo" film-packs.

MOTORS FOR AEROGRAPHS.

(Made by the Aerograph Company, Limited, 43, Holborn Viaduct, London, E.C.

Constant air pressure being an important condition in the commercial use of the Aerograph, both for photographic and process purposes, the two forms of apparatus specially supplied for this purpose become a valuable part of the equipment. For those who have electric supply the best form of apparatus is the Motor Airpump supplied, of 1-6 and \$\frac{1}{4}\$ horse-power, the former at £15 15s., and the latter at £12 12s., in each case suitable for 100 or 200-volt circuit, and allowing of the current being taken from an ordinary electric light fitting. The pump worked by the motor is most ingeniously provided with an automatic valve release, which keeps

the pressure constant at anything up to 40 lbs. per square inch without any attention from the worker. Moreover, when the pressure to which the pump is set is reached the load is thrown off the motor, so that the apparatus is economical both as regards current used and wear and tear. The pump will provide the pressur for about half-a-dozen air-brushes.

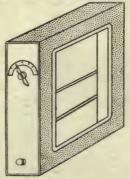
For those who have not electric connection the Aerograph Company's hot-air compressor is a very neat arrangement, which requires only a Bunsen burner, or even a spirit lamp. It is sold at a cost of £10 10s., complete with reservoir, and provides the neces-

sary pressure for one aerograph brush.

THE "UNIT" FOCAL-PLANE SHUTTER.

Made by the Thornton-Pickard Manufacturing Company, Limited, Altrincham, Cheshire.)

The shutter of the self-capping, quick-wind, focal-plane type which we reviewed last year in reference to its fitting to the Thornton-Pickard reflex, is now issued separately by the company in the three sizes of quarter, 5×4 , and half-plate at £3 10s., £3 17s. 6d., and £4 4s. respectively. Although of such very rapid wind, the makers have yet succeeded in reducing its thickness to



14 ins. — a degree of slimness to which the drawing does not do justice. The working parts of the shutter, apart from the blind, are of metal, and mounted on a single metal plate, the whole being simply mounted in the outer case of wood. Thus the removal of the side plate of brass allows of the entire shutter being taken out for examination. The very ready winding to any one of the series of blind-apertures, coupled with the speed with which time exposures may be given, will recommend the shutter to the practical worker. As now made separate it may be fitted to almost any camera of the stand or hand-stand type.

THE THORNTON-PICKARD "VEST-POCKET" CAMERA.
(Made by the Thornton-Pickarl Manufacturing Company, Limited, Altrincham,
Cheshire.)

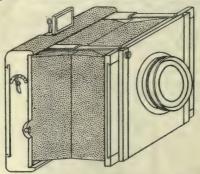
This new addition to the many varieties of Thornton-Pickard cameras is made to take the plate of 2-5/16 × 1½ ins., and, though

of such dimensions that it may be carried in the waistcoat pocket, is nevertheless fitted with the "Unit" focal-plane shutter. The camera front extends on four metal struts, and focussing is provided by the mount of the lens. The camera is fitted with the convenient direct-vision finder.

THE "UNITA" FOLDING FOCAL-PLANE CAMERA.

(Made by the Thornton-P: kard Manufacturing Company, Limited, Altrincham, Cheshire.)

In this, the first, model of Thornton-Pickard folding focal-plane camera the shutter provided is the "Unit," to which reference has already been made. This type of shutter no doubt is responsible for the small bulk to which the makers have reduced the apparatus, whilst as regards weight also the "Unita" is one of the lightest focal-plane cameras we have handled. The shutter is pro-



vided with pneumatic and trigger release, the latter being of the excellent form with which pressure is a direct thrust against the body of the worker, whilst the pneumatic release allows of the use of the T.P. time-valve, giving the series of exposures of one second and large fractions of a second. Finished throughout in black leather and black ebonised wood, the camera is of very handsome but unobtrusive appearance. It may be fitted with the usual lenses in focussing mounts, rising front for which is provided. The finder is of the direct-vision type fitted with magnifying lens, which can be used or turned out of the way at will.

THORNTON-PICKARD REFLEX CAMERAS.

(Made by the Thornton-Pickard Manufacturing Company, Limited, Altrincham Cheshire.)

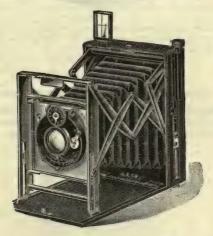
The "Unit" shutter used on both the "Royal Ruby" and "Ruby Nos. 1 and 2" represents the chief direction in which these reflector cameras have been further improved. The "Royal Ruby," it will be remembered, has the universal rising and swinging front of the

"Ruby" camera, and allows of very long extension and the widest range of lens movements. In the case of the "Ruby's," these cameras are now built with a detachable lens box, provided with skyshade, which is very nicely fitted so that it stops in any position. The camera is fitted with reversing back in the case of "Ruby No.1," sold at £8 10s.; whilst in the case of No. 2, the double-extension instrument, the back is made to rotate, there is rack and pinion adjustment of the front, and the total extension of 12 ins. is obtained with the single pinion head, which automatically takes up the supplementary rack.

THE "STEREAX" AND "KIBITZ" FOLDING CAMERAS.

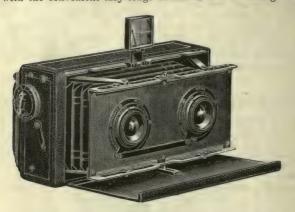
(Sold by A. E. Staley and Co., 19, Thavies Inn, Holborn Circus, London, E.C.)

In this very portable stereoscopic camera, the external dimensions of which are slightly less than $7 \times 3\frac{1}{4} \times 2\frac{1}{4}$ ins., the method of focussing is that already described under the "Nettel" cameras, namely, by means of a fine screw adjustment on the front. The camera is fitted with self-capping focal-plane shutter with 2 degrees of spring tension and alteration of width of slit very conveniently



made by pressing down the pointer placed within the winding key. Complete with six single metal slides, but without lenses, the price is £6 15s., whilst a fixed-focus model, with all the other movements except that of focusing costs £6. The very rapid opening and closing of the camera is an excellent feature of the instrument, the lens front coming out and the finder erecting itself on the camera being opened.

The stereo "Kibitz" is again similar in general design to the "Stereax," and forms an excellent pocket camera strongly made, and with the convenient lazy-tongs extension and focusing. The



camera comes out automatically to any focus to which it is set. The price in $3\frac{1}{2} \times 2\frac{1}{2}$ size, complete with six metal dark-slides, but without lens or shutter, is £3 10s.

THE "HOLOS KINORA" LENS.

(Made by W. Watson and Sons, Limited, 313, High Holborn, London, W.C.

In this lens of $2\frac{\pi}{3}$ in, focus the "Holostigmat" type of construction has been followed in order to obtain a lens of the large aperture of f/3.5 suitable for cinematograph-taking cameras. The lens is



mounted in a rigid barrel projecting just over 1 in. behind the flange, and is fitted with iris diaphragms down to f/22. Even at the full aperture the instrument covers excellently the cinematograph standard size of picture, and should be a most serviceable lens for work of this kind, as also for making direct enlargements in the camera of quite small objects. The price is £5 5s.

THE "MONOSCOPE" VIEWING MIRROR.

(Made by J. Ashford, 179, AstonaRoad, Birmingham.)

Under this name is supplied a circular concave mirror of 4½ ins. diameter, mounted in a stout wood frame covered in leatherette. It provides a convenient and realistic means of viewing postcards and other photographs or drawings of postcard size, the card being



fixed in the clip of the metal strut attached to the mirror and the observer viewing the highly-magnified reflection over the top of the card. In viewing subjects placed the vertical way of the postcard the latter is inserted as before and the apparatus held sideways. The apparatus fulfils its purpose excellently, and should be a very saleable article in conjunction with picture postcards. The price of a single monoscope is 2s. 9d.

THE ROSS HOMOCENTRIC CINEMATOGRAPH LENS.

(Made by Ross, Limited, 3, North Side, Clapham Common, London, S.W.)

In this lens the makers supply a cinematograph lens of 3 in. focal length, but of aperture f/4.8, and covering a circle of $4\frac{1}{4}$ ins. This is a very highly corrected lens, of quality equal to the well-known "Homocentries" of other types, and it would obviously



be well adapted for use on a $3\frac{1}{2} \times 2\frac{1}{2}$ -in. plate. On such a plate it would include a moderately wide angle, and might be of exceptional value at times. The small cinematograph picture is, of course, covered perfectly at full aperture, and for this kind of

work a better lens can hardly be wished for excepting when a larger aperture such as that of the Ross-Zeiss "Tessar" is required. The price of the f/4.8 "Homocentric" in rigid mount with iris diaphragm is £5.

COOPER-HEWITT MERCURY-VAPOUR LAMP FOR STUDIO AND PRINTING

(Sold by O. Sichel and Co., 52, Bunhill Row, London, E.C.)

As sold by Messrs. Sichel, the lamps are mounted on a frame, which is detachable from the arm of the supporting standard, and thus allows of the outfit being readily transportable in a cab, the lamps themselves inside under the photographer's care, and the standard outside. This facility is doubly useful in the case of the mercury-vapour lamp, since the small amount of current required may be taken from an ordinary connection, even from the plug of an incandescent lamp, and therefore the light may readily be used in ballrooms, private houses, and other premises where the electric supply would not be sufficient to run an arc. The importance of this fact to the professional photographer has been emphasised over and over again, but is appropriately repeated once again in connection with the present lamp, the cost of which (complete) is £20 19s. to £22 18s. (according to the voltage), from which sums Messrs. Sichel offer professional photographers a substantial discount.

The lamp is so fitted that it cannot be connected wrongly to the terminals. It is made so that it can be conveniently employed for printing, and the frame of tubes can readily be adapted for enlarging purposes, no condenser being necessary. It may be said, in conclusion, that the photographer, before complaining of the colour of the mercury light, should try the simple experiment of putting in one or two red incandescent lamps to supply the red rays which are lacking in light. He need not fear, as did a recent naïve corre-

spondent, that these red rays will "slow the light."

A STEREOSCOPIC PRINTING FRAME.

(Made by W. Watson and Sons, Limited, 313, High Holborn, London, W.C.)

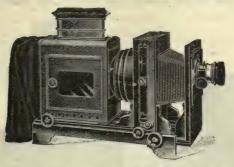
A printing frame serving for the making of full-size stereoscopic transparencies from the standard $3\frac{1}{4} \times 6\frac{1}{2}$ in. negative intact is made by Messrs. Watson at the price of 5s. When making the first exposure the negative is pushed to one end of the frame, and when making the second to the other, the positive transparency plate in each instance being pushed to the opposite extremity of the frame. The aperture through which exposure is made is conveniently provided with a shutter.

THE "RECORD" ENLARGER.

(Made by W. Butcher and Sons, Limited, Camera House, Farringdon Avenue, London, E.C.)

In this new model of their enlargers Messrs. Butcher have provided a universal stage for the negative, giving rise, swing, and tilt by three independent rack and pinion adjustments. The lantern

is also provided with rack and pinion, junction between negative stage and lantern being made by triple telescopic tube. The body of the lantern is excellently provided as regards ventilation, but leakage of light is perfectly obviated by the light-traps in the base



and the special collapsing curtain at the back. Rise and fall of the lens panel operated by rack and pinion is also fitted; whilst, of course, the ordinary extension of the front is by the same movement. The price complete with condenser, but without projection lens, is £4 15s. in quarter-plate size, £7 15s. in half-plate. For the full range of movements provided these are extremely moderate prices, but Messrs. Butcher supply an even lower-priced enlarger, the "Albbeydale," sold at £3 5s. in quarter-plate and £5 15s. in half-plate. This resembles the "Record" in general construction, has the rack and pinion tilt, but is provided with negative carrier of a simpler pattern. It is nevertbeless an excellent enlarging lantern for the amateur worker.

NEW MODELS OF REFLEX CAMERAS.

(Sold by Ross, Limited, 3, North Side, Clapham Common, London, S.W.)

In the reflex camera of the convenient $3\frac{1}{2} \times 2\frac{1}{2}$ -in. size which Messrs. Ross supply the camera is made to take the picture the land-scape way of the plate, and the focussing hood takes the ingenious form of a perfectly closed hood, provided with a single magnifying eye-piece. The hood is quickly collapsible, and, being attached to a separate frame, can be removed in an instant from the ground glass, which can thus be cleaned, and, further, gives access to the mirror. The camera is provided with a very rigid extension, allowing of a total length between lens and plate of $7\frac{1}{2}$ ins., and it is fitted with a focal-plane shutter of adjustable slit aperture, giving a very wide range of exposures. The size over all is $5 \times 5 \times 5$ ins. Fitted with three double slides and Ross f/6.3, 5-in. focus "Homocentric," the price is £14, or with f/5.6 "Homocentric," £15. With $4\frac{1}{2}$ -in. Ross-Zeiss "Tessar," f/4.5, the price is £15.

In the larger sizes of this reflex, quarter to half plate, a tropical model is made, being built of teak, with extra brass binding and lacquered brass fittings. The bellows and hood are of Russia leather, and the lens is provided with extra large shade, also covered with Russia leather. The reflex is now fitted with wheel





and pinion adjustment, turning back without projection, a convenience which is available in the ordinary as well as in the tropical model. The price of the latter in quarter-plate size, with three double dark slides and 5½ in. Homocentric, f/6.3, is £22 2s.

NEW MODEL "COOKE" LENSES.

(Made by Taylor, Taylor, and Hobson, Limited, Stoughton Street, Leicester.)

A further convenience in the use of the extension lenses for the "Cooke" anastigmats which Messrs. Taylor, Taylor, and Hobson have made for some years past is provided by a new pattern of the extension lens for the Series II. f/4.5 "Cooke." These are made to replace the front glass of the lens instead of the back, as in the other series. They are sent out mounted in brass cells with the convenient standard thread, and hood for the lens cap.

The "Cooke" lenses are now also made in sunk mounts of the form specially useful in reflex and other hand cameras. The focal lengths listed in this form are 5, $5\frac{1}{2}$, 6, 8, and $10\frac{1}{2}$ ins., whilst the series of lenses in which these are obtainable are the f/4.5 Series II., f/6.5 Series III., f/5.6 Series IV., and f/8 Series V. We have had an opportunity of examining a lens of the Series IV., of 6.2 ins. focal length, intended for a 5×4 camera, and are bound to express our admiration of the beauty of the mechanical work—there is no need to repeat encomiums of the optical quality of the "Cooke" lenses. The lens in question projects into the camera

about 14 in. from the back of the flange, the front and rear combinations being very quickly detached and refitted owing to the special form of thread adopted by Messrs. Taylor, Taylor, and Hobson.

THE "TINY TELLA" REFLEX.

(Made by the Tella Camera Company, 68, High Holborn, London, W.C.)

In this reflex camera of $3\frac{1}{2} \times 2\frac{1}{2}$ size the makers, by a quite distinct design, have produced a body of dimensions slightly under $4\frac{1}{2} \times 5\frac{3}{4} \times 5$ ins. This portability is secured apparently by making the focal-plane shutter pass towards the front and lower part of the camera when being wound; the winding key is placed near the front of the instrument. The shutter is adjusted for speeds



from 1-1,000th to 1-5th of a second, which are obtained by turning the key until the actual speed number appears in the small window on the left of the camera. When exposing by time, the shutter is wound to the full extent; pressure on the release then uncovers the plate, and a second pressure covers it. Like the other Tella reflexes made at the firm's London works the camera is fitted with rack-and-pinion rise of front, reversing back, self-erecting hood, which is immediately detachable, and a long extension—in the $\frac{51}{4} \times \frac{21}{4}$ size, of $\frac{81}{4}$ ins. The price, complete with Ross "Homocentric" $\frac{7}{6}$ 6-3 and six single metal slides is £14, whilst a special tropical model is made at the price of £14 14s. for camera and six slides only.

THE $3\frac{1}{2} \times 2\frac{1}{2}$ "ARGUS" REFLEX.

(Made by W. Watson and Sons, Limited, 313, High Holborn, London, W.C.)

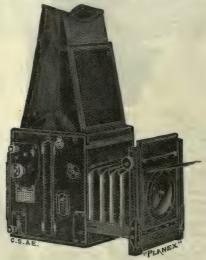
Messrs. Watson have now placed on the market a $3\frac{1}{2} \times 2\frac{1}{2}$ size of their well-known and excellent "Argus" reflector camera. The camera is of the same substantial construction as the larger sizes, and measures over all about $5 \times 5\frac{1}{2} \times 6\frac{1}{2}$ ins. The total extension is

close on 8 ins., the front being very rigidly supported on a pair of metal runners. There is a rise of front of § of an inch, as well as a fall of nearly half an inch, both movements being actuated by a rack and pinion. The hood is self-erecting, and folds back on its hinges, giving instant and complete access to the focusing screen. In the important matters of the shutter and mirror the makers adhere to the movements found successful and reliable in the larger patterns of "Argus," that is to say, a mirror which falls again after exposure, and a shutter which is adjustable both by alteration of slit and tension, the latter while the shutter is set. Complete with rotating back and three solid double slides, the price of the $5\frac{1}{2} \times 2\frac{1}{2}$ "Argus" is £11 7s.; with three book-form slides the price is £12 10s.; or for the same price the camera may be obtained with a changing-box for twelve plates.

NEW MODEL "PLANEX" CAMERAS.

(Sold by the City Sale and Exchange, 93 and 94, Fleet Street, London, E.C.)

In the two models of reflex camera, the "All British" and the "No. 2," Planex, supplied by this firm a number of minor improvements have been made in the 1910 instruments whilst pre-



serving the general design. In the "All British" (illustrated) a very large lens shade is provided, whilst the focussing hood has a depth of 9 ins. The total extension obtained by aid of the reversing lens mount is 11 ins. in the quarter-plate size, whilst both in this camera and the "No. 2" an improved type of quick wind and

adjustable focal-plane shutter is provided. Both cameras have the full range of movements of the previous model, whilst a new feature of the "No. 2" is a rotating instead of a separate reversing back. The prices of the "All British" range from £9 10s.; those of the "No. 2" from £7 7s., in each case with three double dark-slides.

The City Sale, it may be added, now supply their "Blitz' double anastigmat in a new series of f/48 aperture, these lenses being especially suitable for the reflex camera, since at the full aperture they cover the plate for which they are listed, whilst the separate components can be used as long-focus lenses. In addition to this, at a medium stop the complete lens may be used as a wide-angle on a larger plate. The prices range from £4 4s. for the 5-in. focus to £19 10s. for the 15-in.

"ENSIGN" FOLDING POCKET CAMERAS.

(Made by Houghtons, Limited, 88 and 89, High Holborn, London, W.C.)

The well-known firm of High Holborn has this year, among a large series of new designs in cameras, introduced two models of the all-popular folding film-camera, one, the 000, being fitted with "Ensign" Simplex Auto shutter, whilst the 00 has the Bausch



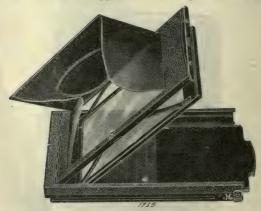
and Lomb "Automat." The 000 is a somewhat cheaper line of instrument, but has all the movements which are called for in cameras of this description—namely, rise and cross front movements, reversible finder and level, infinity catch and diaphragm scale. It is made in the quarter-plate and postcard sizes, at prices from 45s.

in the former, which includes an R.R. lens working at f/8, to 70s. in the latter, complete with Beck f/8 R.R. The roll-holder portions of the cameras, like the other parts, are very well and substantially made, and the instruments in practical usefulness, solidity, and appearance can take their place with any cameras of the kind. The 00 series, shown in the drawing, are priced at from 63s. in the quarter-plate to 127s. 6d. in the postcard size, this latter having f/5.8 anastigmat, and, as already stated, the B. and L. shutter giving exposures from 1-100th to 1 sec., in addition to time and bulb.

THE "HOUGHTON" ENVELOPE CAMERA.

(Made by Houghtons, Limited, 88 and 89, High Holborn, London, W.C.)

Specially built to take the envelope adapter introduced by Messrs. Houghtons about two years ago, this camera is of the box form shown in the drawing, and provided with movements in the way of focussing, finders, etc., which are familiar to users of "Holborn" box instruments. Among these we may mention the convenient adjustment whereby, when the lens is capped, the finders are darkened. The camera is finished in polished mahogany and brass, and presents a handsome appearance when opened, although when



closed for actual work it is conveniently inconspicuous. The envelope adapter provides a very compact setting for the sensitive plate, and keeps the canera both light and small, the dimensions of the quarter-plate being under $7\frac{1}{2} \times 6 \times 4\frac{1}{2}$ ins. The price, complete with focussing screen and hood, R.R. lens, and "Simplex Auto" shutter, is £2 10s., whilst Nos. 2, 3, and 4 of the series, with other shutters and lenses, are marketed at 63s., 70s., and 90s.

The above system of carrying plates or films to any convenient number ready for exposure in a simple apparatus no bigger than an ordinary dark-slide has been very conveniently embodied in the "Houghton" envelope and adapter, described in the "Almanac" at the time of its introduction, but we should record the improvement in the form of envelope by which the plate or film is more expeditiously inserted. In the present form of the adapter the ground glass focussing screen is safely carried between the wooden back forming the focussing hood and the shutter of the adapter. The spring catch is so designed that the adapter is instantly opened to receive the envelope and as instantly closed. The system is applied by Messrs. Houghtons to a variety of sizes of cameras up to half-plate, the price of a quarter-plate adapter varying from 10s. 6d. to 17s. 6d., whilst the envelopes cost 2s. per dozen, unloaded, or 3s. per packet of ten charged with "Ensign" flat films.

THE "ENSIGN" DEVELOPMENT TANK.

(Made by Houghtons, Limited, 88 and 89, High Holborn, London, W.C.)

In this tank the plates (in the rack) are put in at one end of the tank, whilst the developer is inserted at the other through an aperture one inch in diameter, which is closed by a screw stopper. The other end of the tank is likewise closed by a full-size lid provided with a rubber washer, the lid being fixed, forming a water-tight joint with the top of the tank by means of the strong wire springs. One advantage of this latter mode of securing the lid is that if the spring should chance to become slightly weaker with use, it is only necessary to bend one of the pieces somewhat in order to secure the firm adhesion of the lid. It will thus be seen that, if desired, the rack and tank can be placed in a changing bag with the exposed plates, the latter placed in the rack, and the whole removed with the plates perfectly protected from light into the daylight. The developer is then applied through the circular aperture, the cap screwed on, and development allowed to proceed.

The tank can be used in either position, with the result that markings which occasionally result from allowing the plates to remain in one position throughout the whole time of development are avoided; all that is necessary being to quietly reverse the position of the tank, allowing it to stand upon the lid for part of the time, and for another period on the screw cap. The apparatus is very strongly made in nickelled brass, and may be used for both developing and fixing. The price of the tank in quarter-plate size is 7s. 6d.; in 5×4 or postcard $(5\frac{1}{2} \times 3\frac{1}{2})$, 10s. 6d.; and in half-plate, 12s. 6d. The brass racks are supplied in these four sizes at 2s., 2s. 6d., and 3s. 6d., whilst brass tanks, complete with racks, but without the other fitments, are sold at 4s., 5s., and 7s. respectively.

THE "AUTOLOX" ROLL FILM CAMERA.

(Sold by the Oity Sale and Exchange, 93 and 94, Fleet Street, London, E.C.)

This folding pocket camera is of the self-erecting type, the act of drawing down the baseboard bringing the lens front forward and locking it in focus on distant objects. This is done without an

undue complication of mechanism, and similarly when the camera is to be closed the only movement is to press down the supporting struts and push in the baseboard. The camera, which is excellently



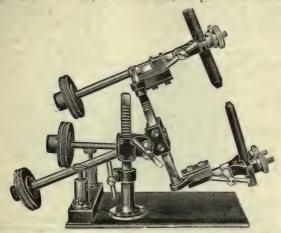
made, is of the double-extension type, a very steady rack and pinion bringing it out for use with half of the double lens, whilst the front is locked by pressing in the focussing head. Another ingenious fitment is the provision of a separate focussing pointer when using the half lens. The pointer is brought automatically into action on racking out the camera, and is carried back again out of the way when reverting to the normal extension. With rise of front, "Compound" shutter, extra rapid "Aplanat" lens, direct-vision finder, three single metal slides in wallet with adapter, and hooded focusing screen when using plates, the price of the "Autolox" is £4 15s.

AN AUTOCHROME PROJECTION LANTERN.

(Made by W. C. Hughes, 82, Mortimer Road, Kingsland, London, N.)

In this lantern, which is a modification of the excellent apparatus made by this old-established firm for enlarging and projection, advantage is taken of the rectangular form of condensers to use a pair of unusually Iong focus, so that the light is a good distance—12 ins. and more—behind the condenser. As a further protection against the heating of the slide, a water tank is placed immediately in front of the condenser, the slide being held in the usual carrier

in front of this, so that the worker may exhibit his Autochrome results without fear of injury in the lantern. In quarter-plate size the price, without lens, is £6 17s. 6d., complete with water tank.



Messrs. Hughes supply a small arc specially made for this lantern at the low price of £3. It is provided with all the necessary movements, and, like the lantern, is of excellent workmanship.

THE PROJECTOR ARC LAMP.

(Made by the Electrical Company, Limited, 121 and 125, Charing Cross Road, London, W.C.)

In the latest pattern of this leading company's arc lamp a rightangled pattern of the two carbons is adopted, and the lamp is provided with the necessary adjustments for separation and inclination of the carbons, raising the light and giving it sideway movement, etc. Made for 50 amperes, the lamp may be used, if necessary, up to an amperage of 80. The price is £5 15s.

THE PHILLIPS EXPOSURE METER.

Made by W. H. Phillips and Son, 98, Truro Road, Wood Green, London, N.)

A most convenient form of exposure calculator is made under this name. It provides the means of ascertaining the exposure for the widest range of subjects, from cloud and sky to dark interiors, in all cases without any kind of mental calculation, and at the same time taking account of all the necessary factors, such as light-intensity, plate-speed, and lens-aperture. Not only this: the calculator is so arranged that the most variable element in the case, the condition of the sky, whether "sun" or "cloud," is adjusted last, so that the worker can keep his meter set to a given subject and plate,

and make the final adjustment in an instant, according to the time of day and state of the light. This shows him the exposure for each of the series of eleven diaphragms from f/2 to f/64. We think the designers of the meter have taken a very sensible course in dividing plates, as regards speed, into seven classes, denoting the most rapid by 64, and taking the numbers 32, 16, 8, 4, 2, and 1 as the denominators of slower plates. In the instructions it is stated that these Phillips numbers ar about 1-10 of the H. and D. number, but it is probable that every worker would fix on the Phillips number which he finds most advisable by one or two preliminary exposures.

e	PHILLIPS EXPOSURE METER. INTERIORS PARK. LICHT	11111	SEA & SKY	A.M IV JAN FEB MAR APR MAY JUN I P.M. VIII	2 4 8 8 8 VIIVI V IV	1 2 4 1 4 4 2 4 4 8 4 4 8 8 9 3 8 16 16 16 16 16 16 16 16 16 16 16 16 16	A DEC A NOV B OCT B SEP G AUG 16 JUL 16
3	LIGHT INTENSITY		124		DIAP	HRAGM:	S
				FIZ	F F F F F	E E E E E	E E E
	SHIR 1975	10 15 8 4 2	102 A	8 15 30 ON 0.5			2 4 8 DURS

The meter is made in polished boxwood, contained in a cardboard case, at the price of 5s. 3d., post free; a No. 2 pattern, in boxwood, stained black, with white lettering and white ivorine sliding scales, price 10s. 3d.; a No. 3, in white ivorine with black lettering, in wooden case, price 15s. 3d.; whilst an "edition de luxe," made in aluminium, is also supplied, price 20s. 6d. The instructions for use with the meter give a good deal of useful information, including the means of using the meter in conjunction with the Steadman "Solio" method of actually measuring the value of the light.

THE "ALPHA" CAMERA, NEW MODEL.

(Made by W. Watson and Sons, Limited, 313, High Holborn, London, W.C.)

In this new model of their well-known hand-stand camera, Messrs. Watson have provided most completely for the requirements of those using a camera both in the hand and on a stand. The baseboard drops and the camera can then be actuated by an auxiliary rack and pinion placed at the back near to the plate, a very convenient movement when using a wide-angle lens. At the normal and full extension focusing is done with the front pinion which provides for a total distance from lens to plate of 12 ins. in the quarter-plate size. The front rises in its struts, and has a further rise of nearly an inch by means of the lens panel, and is also given a swing movement, the total range being ample for all descriptions of work. There is also a swing-back of ample movement, and,

of course, the usual reversing back. The camera is, in fact, most conveniently fitted for the most varied photographic purposes, but measures, when closed, under $5\frac{1}{2} \times 6 \times 4$ ins. It is substantially, though not heavily, built, and costs, in quarter-plate size, complete with three double slides and finder, £8 8s., an extra charge of 15s. being made for the rack and pinion focusing when using the



wide-angle movement. Messrs. Watson fit with the usual lenses and shutters, including their own "Holostigmat," the series Ia. of which has the great advantage of providing an f/4.5 lens, the separate components of which may be used as excellent f/9 single lenses. Thus the No. 5 "Holostigmat." of $5\frac{\pi}{8}$ -in. focus gives single lenses of $8\frac{\pi}{2}$ and 10 ins. focal length.

THE "FRECKLETON" PORTABLE SHADING SCREEN.

(Made by Marion and Co., Limited, 22 and 23, Soho Square, London, W.)

This new and portable accessory for the portrait photographer is equally serviceable in the studio or on the many occasions when a portrait is made at a sitter's home. It consists of a shallow box containing two screens, one of semi-transparent engineer's tracing cloth and the other of an opaque green cloth. Each of these is about 3 ft. 6 in. in width and is mounted on a spring roller. The box is fitted with a triple-extension metal rod, giving a total height, when extended and fixed, of 8 ft. It is erected in the space of a few seconds, and either of the screens is supported on it to this full height in the same time; or both may be used together, the opaque screen usually partly extended where it is necessary to cut off light on the lower part of the sitter. The containing box thus forms a solid base or support for the screens, which latter, of course, may be replaced by the ordinary background material, when the screen becomes a very useful accessory to the amateur portraitist of head and shoulders or three-quarter-length figures. The price of the apparatus complete, with two screens as above described, is £1 15s.

THE "ORIEL" LANTERN-SLIDE CLEANING FRAME.

(Made by the Camera Construction Company, Eagle Works, Durham Grove, Hackney, London, N.E.)

One of the simple, but useful, accessories for lantern-slide work is a holder for cleaning and polishing cover-glasses which, in the "Oriel" pattern, is very substantially made in polished hard wood



and provided with thumb-holes, as shown in the drawing, so that the cover-glass can be instantly removed. The price of the cleaning frame is 1s.

THE "DE BECHI" SUPPLEMENTARY LENS.

(Sold by Alfred B. Allen, 20, Endell Street, London, W.C.)

In this attachment, the supplementary lens is placed behind the back combination of an ordinary rectilinear of say f/8 aperture, which latter, according to the power of the supplementary lens selected, is increased to f/6, f/5 or f/4 with a corresponding reduction in the focal length. Possessors of a half-plate camera and lens who may thus wish to make exposures on a smaller scale but at the full aperture of, say, a portrait or anastigmat lens will find this attachment of frequent service. The supplementary lenses, as we would expect of one having the long experience of Mr. Allen in photographic apparatus and its repair, are very neatly mounted for attachment to the back of the R.R. or for insertion in the aperture of a roller-blind shutter. The set of three suitable for giving the apertures above mentioned is sold at 7s. 6d.

NEW MODEL OF THE "ADON" LENS.

(Made by J. H. Dallmeyer, Limited, 25, Newman Street, Oxford Street, London, W.)

A new form of mounting of the "Adon" lens has been introduced. The loose black lengthening tube behind the front lens has been dispensed with, and a sliding tube substituted. This makes the lens more portable, and in other ways more convenient in working. The power of the negative lens has been slightly increased, and the definition at full aperture has been improved. This new "Adon" will not be on sale until the New Year.

Messrs. Dallmeyer also supply the "Adon" with a hood of about $1\frac{1}{2}$ ins. depth, the use of which is of very great advantage in securing bright telephoto pictures. The hood may be obtained either as a fixture on the lens mount—sliding on the latter so that



it does not add to the bulk of the lens, and allowing at the same time of an orthochromatic filter being screwed into the barrel of the lens. Or, if the filter is not required, the hood itself may be made to screw into the internal diameter of the lens mount.

THE "MERITO" PLATE DEVELOPING TANK.

(Made by W. L. Parkinson, Limited, 5, Commutation Row, Liverpool.)

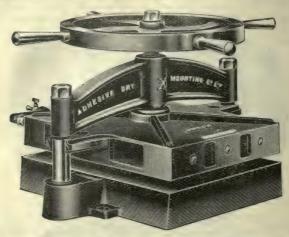
This piece of apparatus for the development, fixing, and washing of plates is very solidly made in brass, and is provided with light-trapped inlet and outlet, so that, in addition to allowing of all the operations being performed in daylight, once the tank has been charged with plates in the dark, it can be used in daylight not only for development, but for the fixing and washing of the plates. It is provided with a strongly made rack holding six plates in three grooves back to back, and the lid is held firmly by a clamp which instantly makes a water-tight joint, so that the tank in use can be turned in any position, and movement of the developer—which is very necessary in order to avoid markings in tank development—may thus be given. The price of the tank in quarter-plate size is 6s. 6d., 5 × 4 postcard 8s. 6d., and half-plates 10s. 6d.

THE STUDIO "X" DRY-MOUNTING PRESS.

(Sold by the Adhesive Dry Mounting Company, Limited, 27, Fetter Lane, London, E.C.)

In this new type of dry-mounting machine, a print as large as 15×12 can be taken and attached at one pressure to mounts up to

17½ × 24½ ins. These dimensions thus fit the press for the purposes of the professional photographer, whilst the price, £5 5s., should be

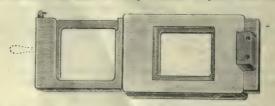


within the means of even a small studio. The press may be used with either gas or spirit, a special heater for the latter being sold at a cost of £2 10s

THE BEARD "BOTH-WAY" CARRIER.

(Made by R. R. Beard, 10, Trafalgar Road, Old Kent Road, London, S.E.)

This lantern carrier is of to-and-fro type, but is made so that it may be used in any open lantern stage either sideways or up and down. The slide is firmly retained in place until required



on the screen whilst the carrier is very accurately made in metal chiefly aluminium with brass for the working surfaces, and is fitted with a finger knob of red fibre, the non-conducting properties of which will allow of its being readily handled, however warm the lantern may become. The price of the carrier is £1 1s.

THE HUME ENLARGER-RACKING MODEL.

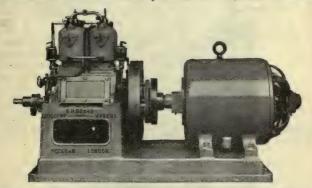
(Made by William Hume, 14, Lothian Street, Edinburgh.)

Mr. Hume, whose many models of cantilever and other enlargers have stood the test of many years before the photographic public, has now brought out a pattern of instrument in which provision is made for tilt of the negative for the correction of distortion, whilst the range of the instrument is further enlarged by making the connection between negative stage and lantern by means of a bellows in order to provide for lenses of different focal length. In other respects, as regards excellence of workmanship and solidity of construction, the model follows the precedent of the other Hume enlargers, and perhaps no more eloquent praise than this could be accorded. In the quarter-plate size, complete with condenser and projection lens, the price of the new racking model (No. 5) is £4, in postcard £5 10s., and in half-plate £7 2s. 6d.

THE BEARD COMBINED MOTOR AND DYNAMO.

(Made by R. R. Beard, 10, Trafalgar Road, Old Kent Road, London, S.E.

For the purposes of lantern and cinematograph work in places where an ordinary electric current is not obtainable this self-contained equipment of engine and dynamo will prove of service particularly to cinematograph exhibitors among our Colonial readers. The engine is made in three patterns of one, two, and three



cylinders respectively, sufficient to generate from 660 to 6,000 watts. Though intended primarily for generation of current the engine may be used as a motive power for driving other machinery. As supplied, it is mounted on a cast-iron stand, includes 6- to 8-gallon tank, accumulator, induction coil, and cooling tank, but not the switch-board and other accessories which may be necessary. The prices of the outfit range from £45 to £150.

THE "DEGA" MINIMETER.

(Sold by Chas. Zimmermann and Co., Limited, 9 and 10, St. Mary-at-Hill, London, E.C.)

This is a most handy instrument for the rapid and accurate measurement of small quantities of liquids, such as rodinal, or other single-solution developer, only a little of which is used at a time when developing an odd plate or two. The graduated measure, when used for quantities from 5 minims to, say, 1 drachm, can easily give rise to considerable errors arising from the angle at which



the level of liquid is viewed, the quantity of liquid left in the measure, etc., and it is not practicable to measure off small quantities quickly. In both these respects the "Minimeter"-which is an improved chemical pipette-has claims to recommend it. It consists of a glass tube 7 ins. in length, graduated to deliver up to 80 minims, or 5 ccs. The minim scale is graduated into 5-minim divisions, the metric scale to & ccs. To use the meter, all that is necessary is to drop it into the stock bottle of solution, squeeze the bulb strongly, and release it gently, removing the tube when the liquid has risen to the 0.0 mark. Any desired quantity can now be delivered most accurately into a measure or other receptacle by gently deflating a projection on the top of the bulb. By so doing, air is admitted to the top of the tube, the liquid escapes, and on releasing the projection the level of the slowly falling liquid is arrested at any point. For working in the darkroom the meter saves altogether the trouble of drip from bottle necks, economises developer, and increases the

exactness of measurements, which, as we have said, may often be out to an unrealised extent. The "Minimeter" is sold at 1s. Su.

THE ADAMS "VAIDO" UNIVERSAL CAMERA.

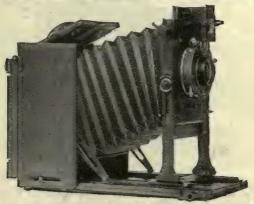
(Made by Adams and Co., 26, Charing Cross Road, London.)

The illustrations, which are direct photographs of this camera, show very clearly the range of movements which the makers have provided in this instrument of the self-contained hand-stand type. They show the result obtainable, but unfortunately they do not and cannot show the many nice devices and ingeniously contrived pieces of mechanism which permit of convenient and rapid manipulation. Remove the occasion of fumbling with a screw or a catch, and you

provide a camera capable of better work. This is a sound principle, and one which makers who know not only cameras but the users of them will confirm. And that principle is evidently one which the makers of the Adams cameras keep prominently before them. It is

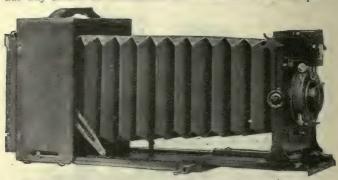


in this respect that the new "Vaido" has points of superiority which the discriminating worker will appreciate. Take, for example, the rise of front. Mr. Adams provides, as do many makers, the most convenient rack and pinion adjustment of it. But



he goes further, and gives the head of the pinion the star form seen most plainly in the second photograph, so that when the front is close in at the wide-angle position, the worker can use one finger only and do easily with a poking movement what he could not readily do

in the case of screw-head requiring two fingers to move it. A refinement perhaps, but nevertheless one which the worker will be grateful for. The same purpose, to provide fittings which make for smoothness of manipulation, might be instanced in other items—but why should we demonstrate to all the world how the photo-



grapher is so pampered by makers like Messrs. Adams that he has but to pull out a lever somewhere and allow the rest to happen? At any rate, he is relieved of the need of thinking much as to the adjustment of his instrument.

As the drawings show, the "Vaido" is fitted for use in the hand



by aid of its focussing scale and the most valuable "Idento" finder, which indicates the change in the picture when the front is raised. The "Vaido" has a large rise, and useful as that movement is in hand-camera work, its value is practically negatived unless the finder shows what is happening.

Specially valuable, too, is the rotating back, which dispenses with the loose reversing frame, and permits the change from upright to landscape with the plate all ready for exposure. The central-swing movement of the lens panel is still another feature that earns our commendations, not only for its simple method of being put in and out of action, but for the fact that though the whole camera is highly compact, the lens panel accommodates the large f/4.5 anastigmats of suitable focus.

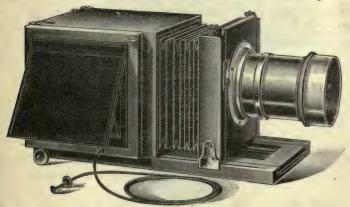
The camera provides a full long extension, and is fitted with a second scale for the half-lens or a second lens of long focus, while, of course, the hooded focussing screen allows of actual focussing being done in the many circumstances when such course is necessary.

We have left to the last the new focal-plane shutter, the "Minex," fitted to the camera. This we describe in the notice on another page of the "Minex" reflex. The shutter is that fitted to the "Vaido." We have said enough to show that in the "Vaido" the makers have provided an instrument without a single loose part, is light, compact, and simple, yet capable of responding to the most extreme claims of the photographer.

THE "SICHEL" STUDIO REFLEX CAMERA.

(Sold by O. Sichel and Co., 52, Bunhill Row, London, E.C.)

The advantages of a camera of the reflex type for studio portraiture, particularly of children, being very considerable, there is good reason to call attention to a model of camera built solely for



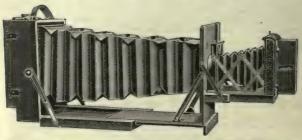
studio work. The exposure is given by means of the mirror, which is actuated by a spring and released with the "Antinous" attachment. This allows of short exposures of the duration given with "cap off and on." The focusing screen is placed at the side of the camera, and is thus conveniently viewed when the camera is used at the usual

height, but the instrument can be turned over on its side, this position allowing of a very low point of view being taken. Focussing is done by rack and pinion from the rear, whilst the total extension of 24 inches is obtained by pulling out the front. The minimum extension is 12 inches. The instrument is solidly made, and complete with three double slides, but without lens, costs £10 in the half-plate size.

"N. AND G." ENLARGER FOR "SIBYL" NEGATIVES.

(Made by Newman and Guardia, 17-18, Rathbone Place, London, W.)

A folding enlarger of very convenient pattern has been introduced by Messrs. Newman and Guardia purely for use with their "Sibyl" cameras. The illustration shows the manner of using the apparatus,



the "Sibyl" being simply placed on the outside board of the enlarger and a light-tight joint made by the special mounting provided by the latter. The enlarger is made for both the 3½ × 2½ and quarter-plate "Sibyls" to give a print of half-plate or whole-plate



in each case. The prices are from £3 5s. to £4 5s., and the apparatus, which is instantly folded after use, allows of large photographs being very quickly and easily made from the negatives of the "Sibyl."

THE "SANDERSON," HAND AND STAND CAMERA, 1909 MODEL.

(Made by Houghtons, Limited, 88 and 89, High Holborn, London, W.C.)

In the latest model a rack and pinion adjustment is provided for the camera when used in the wide-angle position—that is to say, on that portion of the runner board which forms part of the back body of the camera. In place of the hand adjustment, which formerly had to be made, the camera, when being thus used for wide-angle work, is conveniently racked by a small screw projecting slightly from the back body. Also the rising front in the "Regular" and "Tropical" models is now brought more into line with the



de luxe pattern by having a rack and pinion adjustment. And, further, the reversing back is now released from the body by pressure upon a single stud, which actuates the two spring catches which secure the back, a movement which is certainly a convenience, as frequently when the camera is being held in the hand it is something of an inconvenience to raise both springs at the same moment. The prices of the "Sanderson" with these additions and its already well-known features remain the same, and are described in the special booklet which Messrs. Houghtons issue.

[The separate items in the foregoing "Novelties in Apparatus" section are Indexed in the General Index to the Text portion of the "Almanac," placed at the end of the volume.]

FORMULÆ FOR THE PRINCIPAL PHOTOGRAPHIC PROCESSES.

ORTHOCHROMATIC PROCESSES.

(Most of the formulæ in this section are those used in the three-colour and process department of the L.C.C. School of Photo-Engraving, Bolt Court, London, E.C., to the Principal of which, Mr. A. J. Newton, we are indebted for assistance in arranging them in the present form.—Ed. B. J. A.)

Sensitisers for Gelatine Plates.

1 .- For blue-green and green.

To sensitise up to wave-lengths, 5,500 A.U., the best dye is acridin orange, N.O. of the Leonhardt Farbwerke, Mülheim, Germany. It is used as directed below for green and yellow sensitising, except that ammonia must not be used.

2 .- For green and yellow, but not red.

To sensitise up to 5,900 A.U., erythrosine is still the best dye though it leaves the plates somewhat insensitive to bluish green. The most suitable dye is that of Dr. Schuchardt, Goerlitz, or of Meister Lucius and Bruning, Hoeschst, a/M.

One part of dye is dissolved in 1000 parts of alcohol, and a bathing

solution made as follows :-

 Stock solution 1: 1000
 ...
 100 parts

 Water
 ...
 400 parts

 Ammonia (0:880)
 ...
 ...
 5 parts

This is a 1:5000 solution.

N.B.-Ammonia must not be used with acridin orange.

3.-Green, yellow and red.

To sensitise for all rays up to 6200 to 6400 A.U. the following are used:-

Orthochrome T, Pinaverdol, Pinachrome, or Homocol, their order as red sensitisers being as above.

A stock solution is made containing 1 part of the dye in 1000 parts alcohol. The bathing solution contains:—

This is a 1:50,000 solution.

The stock solution will keep, but the weaker bath will not. A red light is used, until it is seen that the solution has covered the plates, after which the operation must be continued in total darkness.

4.—Extreme visible red.

To sensitise for the extreme visible red, *pinacyanol* should be used. The operations can be done in a weak green light, passing the part of the spectrum between 5,000 and 5,300. The dye solutions are prepared exactly as those of Orthochrome T, etc. See above.

5.—Panchromatic Plates.

Use a 1-50,000 solution of a mixture of pinachrome and pinacyanol, viz., 3 parts pinachrome stock solution, 2 parts pinacyanol stock solution; water, 250 parts.

6.-Infra red.

The best sensitiser for the infra red is dicyanine, which is prepared and used exactly as pinacyanol, except that the stock solution must not be added to the water until the very last moment, when everything is quite ready, and the plate can be immediately flowed with the solution, as the weak solution loses its sensitising power very quickly.

If ammonia is used with the cyanine sensitisers given in 3, 4, and 5, it must be quite pure, or fog will be produced. It is best to dispense with it, but if used the proportion is about 1 part per 100 of sensitising

bath

PRACTICAL NOTES ON BATHING.

The dye solution is prepared in a measure, the plates are dusted and laid in a flat porcelain dish, which is large enough to hold nearly twice the number of plates it is desired to sensitise at one time. These are put at one end of the dish; the dish is then tilted, and the dye solution poured into the other (empty) end, then the dish is tilted back, so that the dye solution sweeps over the plates in one even flow free from air bells. The dish is now gently rocked for three minutes, then the plates are removed and washed in a good stream of running water for at least another three minutes. Their sensitiveness will

ILFORD ORDINARY (Yellow Label). EMPRESS (Salmon Label). SPECIAL RAPID (Red Label).

Easiest and Most Reliable Plates in the World.

No troubles, worries, or failures.

Full Price Lists post free on application.

ILFORD, Limited, ILFORD, LONDON, E.

Grand Prix, Franco-British Exhibition, 1908; Gold Medal, Internationa Photographic Exhibition, Dresden, 1909.

probably be somewhat greater if they are washed for ten minutes. They will remain good for months, kept under proper conditions, after three minutes' thorough washing, if bathed according to the formulæ given above.

The water tap should be fitted with one of the small anti-splash filters, the fine wire gauze in which retains any solid particles that

may be in the water.

After washing, the plate should be well swabbed with a wad of cotton wool, and then placed in a drying cupboard. The quicker drying takes place the better, so that if a current of warmed, filtered air, free from fumes, can be sent through the cupboard it is an advantage, though the absence of this convenience need not deter anyone from sensitising plates. Drying can be hastened by placing a dish of dry calcium chloride or quicklime at the top of the cupboard.

Sensitisers for Collodion Emulsion.

FOR GREEN AND GREENISH YELLOW (Hübl).

 Pinaverdol (1:500)
 ...
 1 oz.
 40 c.c.s.

 Collodion emulsion
 ...
 25 ozs.
 1000 c.c.s.

The sensitiveness extends from the orange to the violet.

PANCHROMATIC SENSITISERS (Hübl).

Pinacyanol can be substituted for ethyl violet.

FOR RED SENSITISING.

Pinacyanol (1-1000) 3 ozs. 3 c.c.s. Collodion emulsion 100 ozs. 100 c.c.

FOR BLUE AND (SLIGHTLY) BLUE-GREEN SENSITIVENESS.

The following sensitiser increases the sensitiveness of the collodion for ordinary work:—

Canary II. (sat. sol.) (Reade

Holliday, Huddersfield) .. 1 oz. 10 c.c.s. Emulsion 10 ozs. 100 c.c.s.

The dyed emulsion keeps well, and in half-tone work gives a sharp clean dot, but its speed is not improved.

ILFORD Chromatic and Rapid Chromatic Plates

POPULAR
PRICES. The FINEST Isochromatic or Orthochromatic Plates made.
All liford Plates are supplied BACKED (Anti-Halation to Order.

Full Price Lists post free on application.

ILFORD, Limited, ILFORD, LONDON, E.

Grand Prix, Franco-British Exhibition, 1905; Gold Medal, International Photographic Exhibition, Dresden, 1909.

Safe-lights for Developing.

(Newton & Bull.)

Yellow safe light for wet plates, bromide papers.

	Per sq.	Grs. per sq. in.
	em.	(approx.)
Tartrazine	1 mgm.	10
Or brilliant yellow	0.5 mgm.	20
Or naphthol yellow	. 1 mgm.	10
Or auramine	. 2 mgm.	1
Red safe light for or	dinary plates.	
	Per sq.	Grs. per sq. in.

Safe light for Ortho plates.

The above screen is combined with one containing—

Methyl violet ... 0.5 mgm.

The red screen transmits light from the end of the visible red about λ 7,000 to λ 5,900 in the yellow. The methyl violet absorbs from λ 6,500 to λ 5,000, so that the only light passing the two is the extreme red of λ 7,000 to λ 6,500, to which even the best panchromatic plates are feebly sensitive.

The dyes are dissolved in gelatine solution, which in winter should be about 8 per cent. in strength and about 10 per cent. in summer. About 20 c.c.s. should be allowed for every 100 sq. cm. of glass, i.e., about 20 minims per sq. in. The dyes are added, most conveniently from stock solutions, in quantity to give the proportions stated above in the filters.

DEVELOPERS AND DEVELOP= MENT.

(Arranged alphabetically.)

The following are a few of the typical formulæ generally employed for development, etc. A much greater variety will be found in the section headed "Developing Formulæ of the Principal Plate-makers"

ILFORD Zenith Plates (Chocolate and White Label).

POPULAR PRICES. FASTEST AND BEST PORTRAIT PLATES.

Soft Negatives. Exceptional Latitude. No Fog.

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(pp. 785, &c.). In these as in other formulæ in the ALMANAC "sodium sulphite" without qualification refers to the "cryst" and "recryst" sulphite, and "sodium carbonate" to the crystallised carbonate.

It should be noted also that the metric weights are not equivalents of the British item for item, but that the two formulæ give a solution of the same composition.

Adurol.

Two-Solution.

A.	Adurol		 			19.5 gms.
	Sodium	sulphite	 			175 gms.
	Water		 	• •	10 ozs.	1000 c.c.s.
В.	Potass.	carbonate	 			125 gms.
	Water				10 079	1000 c c.s.

Adurol possesses a character intermediate between pyro and the long-factor developers, metol, amidol, etc.

For studio work and snap-shots take 1 part of A, 1 part of B.

For time exposures outdoor take 1 part of A, 1 part of B, 1 part of water.

ONE-SOLUTION (CONCENTRATED).

Sodium	n sulphite			 4 ozs.	400 gms.
Potass	carbonate	э		 3 ozs.	300 gms.
Water				 10 ozs.	1000 c.c.s.
When all are	dissolved	add:	-		

Amidol.

A normal developer consists of :-

Amidol	 	 2-3 grs.	4·5-7·0 gms.
Sodium sulphite		 25 grs.	57.5 gms.
Water to	 	 l oz.	1000 c.c.s.

ILFORD PROCESS and HALF TONE PLATES

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THE BEST PLATES FOR ALL PHOTO-MECHANICAL WORK.

The HALF TONE PLATE is specially adapted for bathing for three-colour work.

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The mixed developer will keep well in solution for about a week, or sometimes longer, if its concentration does not exceed that given above. It must be made up with freshly dissolved sulphite, as this salt does not keep well in solution for more than a few weeks. A sodium sulphite solution that has had added to it some potassium metabisulphite will, however, keep well for a very long period, and by the addition of dry amidol a fresh developer can be rapidly prepared when required.

Make the following stock neutralised sulphite solution :-

	Sodium sulphi Potassium mei Water to	abisulph	ite	4 ozs. ½ oz. 20 ozs.	200 gms. 25 gms. 1000 c.c.s.
For	use take-				
	Amidol			 2-3 grs.	4.5—7.0 gms.
	Stock sulphite	sol.		 100 mm.	200 c.c.s.
	Water to			 1 oz.	1000 c.c.s.

Azol.

The following are the instructions for the use of this single-solution developer:—

For Plates and Films:-

Normal exposures:	Azol	 20 mins.	to 6 ozs.
	Water	 to 1 oz.	to 6 ozs.
Under-exposures:	Azol	 15 mins.	doz.
	Water	 to 1 oz.	to 8 ozs.
Over-exposures;	Azol	 30 mins.	doz.
	Water	 to 1 oz.	to 4 ozs.

For stand development: -Azol, 1 oz.; water, 100 ozs.

For tank development:—Azol, \(\frac{2}{4} \) oz.; water, 40 ozs. Time of development of films at 60° F., 20 to 30 minutes. This solution may be used several times in succession.

For lantern slides and transparencies: -Azol, 25 mins.; potass.

bromide 10%, 5 mins., water to 1 oz.

For bromide papers:—Azol, 15 mins.; water to 1 oz. A few drops of 10% solution potass. bromide may be added if the whites are grey.

For gaslight papers:—Azol, 40 mins.: water to 1 oz. Add a few drops of 10% solution of potass. bromide, sufficient to keep the whites clear.

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Edinol.

ONE-SOLUTION.

ONE-BOLUTIO.	IN .	
For soft portrait negatives.		
Sodium sulphite	5 ozs.	250 gms.
Edinol	96 grs.	11 gms.
Sodium carbonate	2 ozs.	100 gms.
Water	20 ozs.	1000 o.e.s.
For contrasty negatives.		
Acetone sulphite (Bayer)	288 grs.	33 gms.
Sodium sulphite	4 ozs.	200 gms.
Edinol	96 grs.	11 gms.
Potassium carbonate	2 ozs.	100 gms.
Potassium bromide	48 grs.	5.5 gms.
Water	20 ozs.	1000 c.c.s.

The ingredients should be dissolved strictly in the order given.

Edinol tends to contrast when a carbonate is used: to softness when a caustic alkali is employed. A developer of the latter class contains, in one ounce, edinol, $2\frac{1}{4}$ grs.; caustic soda, $1\frac{1}{2}$ gr.; and sodium sulphite, 10 grs.

Eikonogen.

I	. Sodium sulphite	 		2 ozs.	100 gms.
		 		doz.	25 gms.
	Distilled water	 	0 A	20 ozs.	1000 c.c.s.
E	. Potass. carbonate	 			75 gms.
	Distilled water	 		20 ozs.	1000 c.c.s.

For use, mix equal volumes of A. and B.

ONE-SOLUTION.

Sodium sulphite	 2 ozs.	100 gms.
Sodium carbonate	 1 oz.	50 gms.
Distilled water	 20 ozs.	1000 c.c.s.
Eikonogen	 ½ oz.	25 gms.

Eikonogen is a good developer for full detail without excessive density in the high-lights.

ILFORD

LANTERN Plates

POPULAR

- "Special" for Black Tones.
- PRICES. "Alpha" for a beautiful range of warm tones.
 "Gaslight" for all Tones. No Dark Room needed.

The "Alpha" Lantern is the ONLY Plate of its kind.

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Eikonogen-Hydroquinone.

A. Hydroquinone Eikonogen Sodium sulphite Citric acid Water to	• • • • • • • • • • • • • • • • • • • •	480 grs.	4·5 gms. 14 gms. 55 gms. 2·3 gms. 1000 c.c.s.
B. Potass, bromide Sodium carbonate		60 grs.	0.5 gms. 7 gms. 3.5 gms. 1000 c.c.s.

This developer is suitable for negatives, lantern plates, and bromide papers.

Ferrous Oxalate.

A. Potass. oxalate (neutral), 5 ozs; hot water, 20 ozs. Cool, and pour off clear liquid for use.

B. Warm water, 20 ozs.; sulphuric acid, 30 minims; sulphate of iron, 5 ozs.

Mix 1 oz. of B. with 3 to 4 ozs. of A (pouring B into A, not vice versa).

A more powerful developer is made by dissolving commercial dry ferrous oxalate in boiling saturated solution of potassium oxalate. As much as will dissolve is stirred in, and the whole left to cool, after which the clear solution is poured off for use.

FOR TRANSPARENCIES ON GELATINO-CHLORIDE PLATES.

A	Neutral oxalate of potash	2 ozs.	100 gms.
22.	Ammonium chloride	40 grs.	4.5 gms.
	Distilled water	20 ozs.	1000 c.c.s.
B.	Sulphate of iron	 4 drs.	34 gms.
	Citric acid	 2 drs.	17 gms.
	Alum	 2 drs.	17 gms.
	Distilled water	 16 ozs.	1000 c.c.s.

For black tones, mix the above in equal volume.

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Extra Sensitive.

UNAPPROACHED IN QUALITY AND UNIFORMITY FOR ALL RADIOGRAPHIC WORK.

"In our opinion the Ilford X-Ray Plates are the best and most rapid at present obtainable."—The Lancet.

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HURTER AND DRIFFIELD'S STANDARD FERROUS OXALATE DEVELOPER.

		(The I	nowy	aprice	our rout,	1000.)	
A.	Potassium	oxalate					1 part
	Water						 4 parts
B.	Ferrous su	lphate					 1 part
	Citric acid						 0.01 part
	Water	**					 3 parts
C.	Potass, bro	mide					 1 part
	387-4						700

For use take A, 100 parts; B, 25 parts; C, 10 parts. Development to be conducted at a temperature of 65° F.

The ferrous oxalate as compounded above contains in every 1000 parts:—Potassium oxalate, 185 parts; ferrous sulphate, 68.5 parts; citric acid, 0.61 parts; potassium bromide, 0.74 parts.

Glycin.

ONE-SOLUTION (HÜBL).

Boiling water Sodium sulphite		4 ozs. 21 ozs.	1000 c.c.s. 625 gms.
When dissolved add—			
And then in small quantities—	• •	1 oz.	250 gms.
Potass, carbonate		5 ozs.	1250 gms.

This forms a thick cream, which must be well shaken and then diluted with water; for normal work, dilute 1 oz. with 12 or 15 ozs. of water; for very soft results with 30 ozs, of water.

ONE-SOLUTION.

Glycin	 	 1 oz.	33 gms.
Sodium sulphite	 		83 gms.
Potass. carbonate	 		166 gms.
Water to	 	 30 ozs.	1000 c.c.s.

For normal exposures dilute with an equal bulk of water.

Glycin is a slow-acting developer, but perfectly free from stain. It is the best re-agent for "Stand Development" (which see).

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Hydroquinone.

ONE-SOLUTION.

Hydroquinone	 	100 grs.	11.5 gms.
Sodium sulphite			75 gms.
Sodium carbonate	 	3 ozs.	150 gms.
Water to	 	20 ozs.	1000 c.c.s.

May be diluted with an equal volume of water.

This formula is not so quick in action as the next one, but there is less tendency for the great density in the high-lights which is easily produced in cases of under-exposure. In all cases the temperature of the hydroquinone developer should not be allowed to fall below 60°, or the solution becomes inert.

Two-Solution (Caustic Soda).

A.	Hydroquinone	 	160 grs.	18 gms.
	Sodium sulphite	 	2 ozs.	100 gms.
	Citric acid	 	60 grs.	7 gms.
	Potass. bromide	 	40 grs.	4.5 gms.
	Water to	 	20 ozs.	1000 c.c.s.
B.	Caustic soda (stick)	 	160 grs.	18 gms.
	Water to	 	20 ozs.	1000 c.c.s.

For use: -A, 1 oz.; B, 1 oz.; water, 2 ozs.

ONE-SOLUTION (WITH FORMALINE).

Hydroquinone	 	 130 grs.	15 gms.
Sodium sulphite	 	 6 ozs.	300 gms.
Formaline	 	 3 drs.	20 c.c.s.
Water to	 	 20 ozs.	1000 c.c.s.

A slow developer, giving great cle senses in the shadows, and plent of density in high-lights, and specially suitable for line-subjects.

Imogen Sulphite.

1111080	-	- TON PARKEDO	
A. Imogen sulphite		1 oz.	83 gms.
Distilled water (warm) .		12 ozs.	1000 c.c.s.
B. Sodium carbonate .		1 oz.	500 gms.
Water		2 ozs.	1000 c.c.s.

For correct exposure, A, 2 ozs.; B, 2 ozs.; water, 4 ozs. For underexposure or soft negatives, A, 1 oz.; B, 3 ozs.; water, 4 ozs. For

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Distinguished from all others by its Exquisite Quality and
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over-exposure, A, 2 ozs.; B, 2 ozs.; water, 3 ozs.; potassium bromide, 40 per cent. solution, 1 oz.

Kachin.

A. Kachin	• •	160 grs. (Avoirdupois)	9 gms.
Sodium sulphite Water to		2½ ozs. 20 ozs. (fl.)	62.5 gms. 500 c.c.s.
B. Sodium carbonate Water to		2 ozs. 20 ozs. (fl.)	50 gms. 500 c.c.s.

For use take equal parts of A and B. More diluted developer gives softer results. The solutions should be used at a temperature of 60 to 65 degrees F. Assuming exposure to have been correct, with this solution the image commences to appear in about one minute, and when full density is required development is completed in from four to six minutes. Softer effects are obtained in from three to four minutes. No restrainer is really necessary, but in the case of overexposure the use of a few drops of 5 per cent. solution of ordinary borax is recommended.

Kachin is almost free from staining properties, and is excellent in its clean development of stale plates, on which it does not produce the common iridescent markings.

Metol.

ONE-SOLUTION (HAUFF).

Metol		 	150 grs.	16 gms.
Sodium sulph	ite	 	21 ozs.	125 gms.
Sodium carbo	nate	 	3½ ozs.	175 gms.
Potass. bromi	de	 	16 grs.	2 gms.
Water		 	20 ozs.	1000 c.c.s.

For portraits, take stock solution, 1 oz.; water, 1 oz. For land-scapes, stock solution, 1 oz.; water, 2 ozs.

Metol gives delicate negative with great detail and little density unless development is greatly prolonged. See "Factorial Development."

ILFORD Platona

Genuine Platinum Paper.

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Two-Solution (Hauff).

A.	Metol	 	150 grs.	16 gms.
	Sodium sulphite	 	21 ozs.	125 gms.
	Water to		20 ozs.	1000 c.c.s.
B.	Sodium carbonate	 	31 ozs.	175 gms.
	Potass. bromide		16 grs.	2 gms.
	Water	 	20 ozs.	1000 c.c.s.
		 	_	1 4 45 4

For portraits, A, 1 oz.; B, 1 oz. For landscapes, A, 1 oz.; B, 1 oz. water, 1 oz.

ONE-SOLUTION (ANDRESEN).

Metol	 	 160 grs.	18 gms.
Sodium sulphite	 	 3½ ozs.	175 gms.
Potass. carbonate		 13 ozs.	87.5 gms.
Potass. bromide	 	 22 grs.	2.5 gms.
Water	 	 20 ozs.	1000 c.c.s.

For use, take 1 part of developer to 3 of water.

Two-Solution (Andresen).

A.	Metol		 	 160 grs.	18 gms.
	Sodium	sulphite	 	 34 ozs.	175 gms.
	Water		 	 20 ozs.	1000 c.c.s.
B.	Sodium	carbonate		 31 ozs.	175 gms.
	Water		 	 60 ozs.	3000 c.c.s.

One part of A is mixed with 3 parts of B, potass bromide being added as required for prevention of fogging.

Metol-Hydroquinone.

ONE-SOLUTION.

Metol	 35 grs.	4 gms.
Sodium sulphite	 2 ozs.	100 gms.
Hydroquinone	 . 50 grs.	5.7 gms.
Sodium carbonate	 1 oz.	75 gms.
Distilled water to	 20 ozs.	1000 c.c.s.

This is mixed with an equal volume of water at the time of use.

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TWO-SOLUTION.

A.	Metol	 	 40 grs.	4.5 gms.
	Hydroquinone	 		5.7 gms.
	Sodium sulphite		120 grs.	14 gms.
	Potass. bromide	 	15 grs.	2 gms.
	Water to		 20 ozs.	1000 c.c.s.
B.	Sodium carbonate	 	 doz.	25 gms.
		 	 20 ozs.	1000 c.c.s.
Mix	in equal parts.			

In cold weather it is best to increase the proportion of metal to hydroquinone—to say, 60 grs. metal, 30 hydroquinone.

Ortol.

ORTOL-SODA.

A.	Ortol	 	140 grs.	15 gms.
	Potass. metabisulphite		70 grs.	8 gms.
	Water, cold	 	20 ozs.	1000 o.c.s.
B.	Sodium carbonate	 	2½ ozs.	125 gms.
	Sodium sulphite	 	$3\frac{1}{2}$ ozs.	175 gms.
	Potass. bromide	 	10-20 gis.	1·1-2·3 gms.
	Water	 	20 ozs.	1000 c.c.s.

100 minims of 1 in 2 hypo solution may be added to solution A, and is said to brighten the shadows, but this addition is of doubtful value.

In cold weather the potassium bromide may be left out.

For quick development take 1 part of A and 1 part of B. For slow and soft development take 1 part of A, 1 part of B, and 1 part water.

Ortol solution should not be made up with sodium sulphite, otherwise red stain may be caused, nor should ammonia be used with it. In other respects it closely resembles pyro.

Paramidophenol.

ONE-SOLUTION.

Potassium metabisulphite	6 ozs.	
Distilled water	20 ozs.	1000 c.c.s.
	2 ozs.	
Dissolve in the above order and ad	d gradually-	
Countie and an materia	-	0.0

Caustic soda or potash to dissolve the precipitate first formed.

ILFORD

GASLIGHT PAPER

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Portrait Matt, and Portrait Carbon Surface
POPULAR (semi-matt). Superb Results.
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For use, dilute 1 oz. with from 10-30 ounces of water.

Paramidophenol is non-stainless and keeps well in single solution owing probably to its preservative action on soda sulphite.

Two-Solution.

A.	Paramidophenol hydroc	hlorid	le	200 grs.	23 gms.
	Potassium metabisulphi	ite		100 grs.	11.5 gms.
	Distilled water to			20 ozs.	1000 c.c.s.
B.	Sodium sulphite			11 02.	62.5 gms.
	Potassium carbonate			11 oz.	62.5 gms.
	Distilled water to			20 ozs.	1000 c.c.s.

For use, mix 1 oz. of A with 2 ozs. of B.

Pyro-Acetone.

A.	Pyro		 	1 oz.	100 gms.
	Sodium sulphite		 	4 ozs.	400 gms.
	Distilled water to	٥	 	9 ozs.	1000 c.c.s.

Potassium metabisulphite must not be used, unless neutralised, and there should be no addition of citric acid.

A normal developer consists of :-

	pyro, 4	grs.	or 8	gms.)	40 minims	80 c.c.s.
Acetone					40 minims	80 c.c.s.
Water					1 oz.	1000 c.c.s

and is made by measuring out 40 minims of A solution, adding 40 minims of acetone and making up to 1 oz.

Pyro-Ammonia.

(10% SOLUTIONS.)

					. ,-			
A.	Pyro	solution	88	for	pyro-	potash	or p	yro-soda.

В.	Potass. bromide	1 oz.	100 gms.
	Distilled water to	9 ozs.	1000 c.c.s.
C.	Liquid ammonia (0.880)	1 oz. (fl.)	100 c.c.s.
	Distilled water to.	9 078.	1000 c.c.s.

To make a normal developer, take A, 20 minims; B, 10 minims; C, 30 minims; water to 1 oz.; or if no bromide is used, A, 20 minims; C, 10 minims; to water, 1 oz.; or in metric measures, A, 2 c.c.s.; B, 1 c.c.; C, 3 c.c.; water to 1 oz.

Pyro-Soda Developer.

Make up two solutions according to the following formulæ-

A.	Neutral sulphite solution	 14 ozs.	700 c.c.s.
	Pyro (sublimed or cryst.)	 160 grs.	18 gms.
	Water to make	 20 ozs.	1000 c.c.s.
В.	Soda carbonate .:	 4 ozs.	200 gms.
	Water to make	 20 ozs.	1000 c.c.s.

Take A, 1 part: B, 1 part: water, 2 parts.

The following is the neutral sulphite solution-

Soda sulphite cryst.	 4 ozs.	200 gms.
Potass. metabisulphite	 ½ oz.	25 gms.
Water to	 20 ozs.	1000 c.c.s.

This developer will produce negatives free from pyro stain, and 4 to 6 minutes' development at normal temperature with full exposure will yield soft negatives full of detail and well suited to enlarging. The advantages of the developer are its cleanliness and the extraordinary keeping qualities of the A solution.

When stronger negatives are required, the developer can be made up by taking equal parts of A, of B, and of water, or equal parts of A and B alone can be used, this giving a developer containing 4 grains pyro to the ounce.

The mixed solution can be used for several plates in succession if a little extra time is given for development in each case.

It will be noticed that in making up A solution 14 parts of sulphite solution must be added to 6 parts of water, which is equivalent to adding 7 parts to 3. If less sulphite solution is taken, a slightly quicker developer is obtained, but the result will show pyro stain in the lights.

It is as well to use freshly made neutral sulphite solution for making up the A solution if absolute freedom from stain is desired.

Pyro-Caustic Soda.

				(VAL	ENTA.)		
	A.	Pyro Soda sulphite				220 grs. 3½ ozs.	25 gms. 162:5 gms
		Water to				20 ozs.	1000 c.c.s.
	В.	Caustic potash or	• •	• •	• •	100 grs.	11.5 gms.
		Caustic soda Water to	• •			70 grs. 20 ozs.	8·5 gms. 1000 c.c.s.
0	bo	1 1 oz . B 1 oz	· wet	or 1 0	· FI		

Take A, 1 oz.; B, 1 oz.; water, 1 oz.

The above is a quick-acting and cheap developer, resembling metal in its characteristics.

Pyro-Metol.

A.	Руго	 	80 grs.	9.2 gms.
	Metol	 	70 grs.	8 gms.
	Potass. metabisulphite	 	180 grs.	20.0 gms.
			30 grs.	3.5 gms.
	Water to	 	20 ozs.	1000 c.c.s.
В.	Soda carbonate	 	3 ozs.	150 gms.
	Water to	 	20 ozs.	1000 c.c.s.

For normal exposures, use equal parts. For under-exposures, increase the proportion of B and add water.

Pyrocatechin.

TWO-SOLUTION.

A.	Pyrocatechin	 	 175 grs.	20 gms.
	Sodium sulphite	 	 1½ oz.	75 gms.
	Water	 	 20 ozs.	1000 c.c.s.
В.	Potass, carbonate	 	 $2\frac{1}{2}$ ozs.	125 gms.
	Water	 	 20 ozs.	1000 c.c.s.

Equal parts are mixed together.

ONE-SOLUTION.

Sodium sulphite	 	 5 ozs.	250 gms.
Water	 	 20 ozs.	1000 c.c.s.
Caustic soda	 	 260-300 grs.	30·0-34·5 gms.
Pyrocatechin	 	 400 grs.	46 gms.

The chemicals are dissolved in this order, and the stock solution kept well corked. It is diluted with 20 times its volume of water for use.

Rodinal.

Rodinal is a concentrated liquid preparation of para-amido phenol, sold also in solid form. The following are instructions for the use of the liquid:—

For general work, development of negatives:—Rodinal, 1 oz.; water, 25 ozs. A stronger solution, e.g., Rodinal, 1 oz.; water, 10 oz., can be used to give density in a shorter time.

For over-exposures it is convenient to keep the following stock solution:—

Rodinal	 	l oz.	30 c.c.s.
Potass. bromide	 	150 grs.	10 gms.
Water	 	l oz.	30 c.c.s.

And add a few drops to the 1:30 rodinal developer in cases of over-exposure.

For under-exposures:—Rodinal, 1 oz.: water, 30, 40, or 80 oz.

Stand Development.

Glycin is a very suitable developer for this purpose, and the following directions are given by Hübl for the use of the formula (given on another page) for a concentrated solution.

Normal developer: -Stock sol., 1 oz.; water, 80 to 90 oz.; potass

bromide, 10 per cent. sol., 80 minims.

In this solution a properly exposed plate should make its appearance in 15 or 20 minutes, and obtain full density in several hours.

For under-exposures:—Stock sol., 1 oz.; caustic soda sol. (10%) 1 oz.; water, 50 oz., warmed to 75 degrees F.

For over-exposures:—Stock sol., 1 oz.; potass bromide, 10% sol. 1 oz.; water, 25 ozs.

Factorial Development.

The total time of development (found by trial to give a certain amount of contrast) divided by the time in which the image first appears is the "factor" of a developer.

The following "Watkins' factors" are abstracted from the instructions from the "Watkins' dark room clock and factorial

calculator ":-

SUGGESTED	FACTORS.
-----------	----------

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	14122412	9 5 43 4 31
0 04	4	34

Pyro-acetone—about double the above figures

r yro-accone—about double the above figures.								
F	actor.	F	actor					
Adurol (Schering or Hauff)	5	Ilford pyro-soda (minimum						
Amidol (2 grs. per oz.)	18	pyro)	53					
Cristoid developer and film	30	Imogen sulphite	6					
Diamidophenol	60	Imperial pyro-soda	43					
Diogen	12	Imperial standard (pyro-						
Edinol	20	metol)	9					
Eikonogen	9	Kachin	10					
Glycin (carb. sod.)	8	Kodak powders	18					
Glycin (carb. pot.)	12	Metol	30					
Hydroquinone (min. B)	5	Metol-hydroquinone	14					
Hydroquinone (max. B)	41	Ortol ,	10					
Ilford pyro-soda (maximum	-	Pyrocatechin	10					
pyro)	41	Quinomet	30					
		Rodinal	40					

Note.—High-factor developers (e.g., metol and rodinal), owing to the long time which is needed for density, tend to softness. Short-factor developers (e.g., hydroquinone and strong pyro-soda) tend to hardness,

as they quickly build up density after the image appears.

Where a factor divides evenly into 60, the product is called a divisor, and will greatly facilitate calculating the total time of development. Thus adurol has a divisor of 12 (60 divided by 5), and if the time of appearance in seconds is divided by 12 the result is the number of minutes to develop.

PYRO-SODA DEVELOPERS. With and without bromide

THE CONTRACT OF CONTRACT									
	Fa	ctor.		Fa	ctor.				
Austin-Edwards (with B)	5	Marion (with B)		43				
Barnet (with B)		43	Mawson (no B)		10				
Cadett (no B)		9	Paget (no B)		11				
Kodak (no B)		12	Thomas (with B)		5				
Edwards (with B)		41	Wratten (no B)		11				
Premier (with B)		41	Wellington (normal)		11				
Gem (with B)		4	Wellington (studio)		15				

THERMO DEVELOPMENT.

See under "Developers" in "Epitome of Progress."

Combined Development and Fixing.

Although there is not much to be said for simultaneous development and fixing on practical grounds, the following formula may be given as one of the best for the purpose:—

A.	Kachin	 	 150 grs.	17 gms.
	Sodium sulphite	 	 3 ozs.	150 gms.
	Water to	 	 20 ozs.	1000 c.c.s.
B.	Caustic soda	 	 160 grs.	18 gms.
	Water to	 	 20 ozs.	1000 c.c.s.
C.	Нуро	 	 1 oz.	560 gms.
	Water to	 	 2 ozs.	1000 c.c.s.

Take:—A, 160 minims; B, 24 minims; C, 20 minims; water to 1 oz; or, A, 32 c.c.s.; B, 5 c.c.s.; C, 4 c.c.s.; water to 100 c.c.s.

Restrainers.

Potassium bromide in 10 per cent, solution is the most common restrainer. The dose is from one half-grain (5 minims) per ounce of developer.

Ammonium citrate solution has the advantage that after it has been added to the developer density can be obtained without further fogsing, though the development of detail is prevented. An average dose with the pyro-ammonia developer is 6 to 10 grains per ounce (60 to 100 minims of solution made by adding ammonia, about 250 minims, to 1 ounce of citric acid dissolved in a little water until neutral, and diluting the whole to 10 ounces).

Potassium borotartrate.—10 to 30 minims of a 10 per cent. solution restrain with most developers.

Sodium bicarbonate acts as a restrainer, particularly with amidol developer.

FIXING, & HYPO ELIMINATORS.

Acid Fixing Baths.

An excellent acid fixer is made by adding about $\frac{1}{2}$ oz. potass. metabisulphite to each pint of fixing bath. The cost is perhaps more than that of the two following baths, but the fixing solution is as good as can be made.

Hypo solution (1:5)	50 ozs.	1000 c.c.s.
To which add a mixture of—	11 00	30 c.c.s.
	13 oz.	
Sodium sulphite solution (1:4)	$3\frac{1}{2}$ ozs.	70 c.c.s.

Alum-Hypo Fixing Bath.

Alum (saturated solution		20 ozs.	1000 c.e.s.
Sodium sulphite (satura	ited s	4—7 ozs.	200-300 c.c.s.
tion) Hypo-solution (1:5)		 20—28 ozs.	1000—1250 c.c.s.

Chrome Alum and Hypo Fixing Bath.

WILL U	THE LABORES	C- A 4	3 00		22000111
Add-					
Strong su	lphuric acid		1	dr. (fl.)	10 c.c.s.
			2	ozs.	80 c.c.s.
to-					
	ulphite		2	OZS	80 gms.
	arphito		6		240 с.с.в.
			0	023.	210 0.0.6.
And pour the m	ixture into—				
Нуро			1	6 ozs.	700 gms.
Water			4	8 ozs.	2000 c.c.s.
Finally add to t					
Chrome a	lum		1	OZ.	40 gms.
Water			8	ozs.	300 c.c.s.

Hypo-Eliminators.

Peroxide of hyd	lrogen (20 vols.)	1 dr.	25 c.c.s.	
Water		5 ozs.	1000 c.c.s.	
After washing the	negative well it	is immersed	for a couple	of
minutes in the solution				

Where peroxide of hydrogen is not obtainable, the following may be

used as a substitute :-

Barium dioxide	 1	oz.	25 gms.
Glacial acetic acid	 10	oz.	25 gms.
Water	 40	ozs.	1000 c.c.s.

Reduce the barium dioxide to a fine powder and add it gradually to the acid and water, shaking until dissolved. A few minutes' immersion in this solution will effectually remove or destroy the last traces of hypo.

PERSULPHATE.

Ammonium persulphate	 	$2\frac{1}{2}$ grs.	6 gms.
	 	5 grs.	12 gms.
Water	 	1 oz.	1000 c.c.s.

PERCARBONATE.

Potassium	percarbonate	 21 grs.	6 gms.
Water		 1 oz.	1000 c.c.s.

PERMANGANATE.

Wash the negative for one minute under the tap, and transfer to a shallow dish containing water with enough potass permanganate in it to turn it pink. Remove the negative as soon as the colour goes, and keep on treating in the very weak permanganate baths until the colour is not discharged. A very cheap and satisfactory process which allows of a negative being ready for drying within three minutes of fixation.

Rapid Drying of Negatives.

Method I.—Rinse from the hypo-bath, place in 1:50 formaline for ten minutes, wash by pouring nearly boiling water six times over the negative and dry by heat. To get rid of the relief which is produced by this process the negative is rubbed with a piece of washleather moistened with alcohol.

Method II.—After washing in the usual way or using a hypoeliminator, lay a piece of old fine cambric on the negative and firmly pass a roller squeegee over it. The negative, with much of the water thus removed, will dry in a few minutes in a moderately warm place.

Method III.—Soak in two successive baths of methylated spirit, and place in a current of air. The present commercial spirit, owing to the mineral naphtha in it, causes a whitish seum on the surface of the film, and is not favourable to clean work.

HARDENING AND CLEARING SOLUTIONS.

Hardening Baths.

Formaline			 	1 oz.	50 c.c.s.
Water			 	10 to 20 ozs.	500-1000 c.c.s.
Alum Water	• •		 	1 oz. 20 ozs.	50 gms. 1000 c.c.s.
		• •	 		
Chrome all	ım		 	1 oz.	50 gms.
Water			 	20 ozs.	1000 c.c.s.

Clearing Solutions.

ACID ALUM.

Alum	 	 	2 ozs.	200 gms.
Citric acid	 	 	1 oz.	100 gms.
Water	 	 	10 ozs.	1000 c.c.s.

Wash moderately after fixing, and immerse the negative in the above. This bath is also useful for removing white scum from negatives developed with ferrous oxalate if rubbed on with cotton wool.

CHROME ALUM.

Chrome alum Hydrochloric acid	 1 oz.	25 gms. 25 c.c.s.
Citric acid	 1 oz.	50 gms.

THIOCARBAMIDE.

Thiocarbamide	 	 90 grs.	10 gms.
Citric acid	 	 90 grs.	I0 gms.
Water	 	 20 ozs.	1000 c.c.s.

SODIUM HYPOCHLORITE.

(Eau de Javelle.)

Bleaching powder	 1 oz.	30 gms.
Sodium carbonate	 1½ oz.	45 gms.

Shake up the bleaching powder with a solution of the carbonate in a little water (6 ozs. or 180 c.c.s.), and filter. Extract the residue with plain water, and again filter. The filtrate (solution of sodium hypochlorite) forms an active stain remover. It can be acidified with oxalic acid, and then discharges yellow stain still more vigorously, but with risk to the silver image.

REMOVING SILVER STAINS.

DOW	T OHO HO	Prent to Tr			
A.	Potass.	iodide	 	 200 grs.	45 gms.
	Water		 	 10 ozs.	1000 c.c.s

And after washing transfer to-

Sook the negative in-

В.	Potass.	cyanide	 	 300 grs.	70 gms.
	Water		 	 10 ozs.	1000 c.c.s.

in which rub the stained part of the film with a pledget of cotton wool.

If the stain does not yield to this treatment a solution of iodine (in potass iodide) may be used in place of solution A.

A remedy for silver stains, which sometimes succeeds, is to rub with pumice powder, and place in strong hypo.

NEGATIVE INTENSIFIERS.

Mercury Intensification.

The negative is bleached in the following saturated solution of mercury bichloride:—

Mercury bichloride (corrosive

 sublimate)
 ...
 ...
 1 oz.
 62 gms.

 Hot water
 ...
 ...
 16 ozs.
 1000 c.c.s.

After cooling this solution and pouring off from the white feathery crystals thrown down, add-

Hydrochloric acid.. 30 minims 4 c.c.s.

After well washing, the bleached negative is blackened in one or other of the following:—

A.	Ammonia	(0.880)	 	 20 drops	20 drops
	Water	• •	 	 l oz.	30 c.c.s.

Gives great intensification and good black colour.

- B. Soda sulphite, 10 per cent. solution, made slightly acid with citric acid. Very slightly strengthens a negative.
- C. An alkaline developer, such as pyro-soda, pyro-ammonia, hydro-quinone, or ferrous oxalate. Gives about double the intensification of B.

This solution must be made fresh, and gives great intensification.

Monckhoven's.

A. Bromide of potassium Bichloride of mercury Water	10 10	grs. 23 gms.	
B. Pure cyanide of potassium Nitrate of silver Water	10	grs. 23 gms.	

The silver and cyanide are dissolved in separate lots of water, and the former added to the latter until a permanent precipitate is produced. The mixture is allowed to stand 15 minutes, and, after filtering, forms Solution B.

Place the negative in A till it is white, then rinse and transfer it to solution B. If the intensification has been carried too far, it may be reduced by treatment with a weak solution of hyposulphite of soda.

Mercuric Iodide.

Water	 	 20 ozs.	1000 c.c.s.
Sodium sulphite	 	 4 ozs.	200 gms.
Mercuric indide	 	 90 grs.	10 gms.

The sulphite must be dissolved first. The solution keeps well in the dark. The plate needs to be rinsed only from the fixing bath, and requires to be immersed for only a few minutes in water and then for a few seconds in hypo (10 grs. per oz.) after sufficient intensification has been obtained. Greater permanency is secured by treating instead with any non-staining developer, or, better, with 5 per cent. solution of sodium sulphite.

If mercuric iodide is not available the following may be used :-

Mercurio	chloride	 	50 grs.	6 gms.
Water		 	10 ozs.	500 c.c.s.

Add 10 per cent. potass. iodide solution until precipitate first formed is redissolved. About $1\frac{1}{2}$ oz. (75 c.c.s.) will be required, and, when clear, add—

Sodium sulphite	 	4 ozs.	200 gms.
Water to make	 	20 ozs.	1000 c.c.s.

Silver Intensifiers.

J. B. B. WELLINGTON'S FORMULA.

	Water	 • •	• •	.,	2 ozs.	60 c.c.s.	
Add-	Ammoniu	 phocya			240 grs. 3 ozs.	15.5 gms. 85 c.c.s.	

This mixture is best made at the time of use, although it may be left for several weeks. To prepare the intensifier, take—

Above mixture ½ oz. 30 c.c.s.

Hypo solution (1 in 4) ... enough to just dissolve white

ppt

Pyro (10% sol.) with sulphite ... 30 minims 4 c.c.s.

Ammonia (10% sol.) 40—60 ,, 6—8 c.c.s.

Plates should be hardened with alum or formalin, for both this and the following intensifier. When sufficient density is obtained the negative is fixed for a minute or two and washed.

ACID SILVER.

A.	Pyro	 	 15 grs.	3.5 gms.
	Citric acid	 	 5-10 grs.	1-2 gms.
	Water	 	 10 ozs.	1000 c.c.s.
В.	Silver nitrate	 	 10 grs.	23 gms.
	Water to	 	 l oz.	1000 c.c.s.

About 1 oz. (30 c.c.s.) of A is poured over the plate, once or twice, about 15 drops of B solution added, and the mixture again applied. Intensification now takes place and the solution is poured off and on until sufficient. If intensifier becomes very thick and turbid, fresh should be mixed up. When dense enough the negative is rinsed, fixed and washed.

Chromium Intensifier.

(C. Welborne Piper.)

Potassium bichromate	A.	B.	C.
	5 grs.	10 grs.	10 grs.
Hydrochloric acid (sp. gr., 1.160)*	1 min.	5 min.	20 min.
	1 oz.	1 oz.	1 oz.

Bleach in A, B or C solution, wash until yellow stain is removed, and then develop with amidol.

A gives intensification about equal to mercury and ammonia; B, to that of mercury and ferrous oxalate; and C, to that of mercury and sodium sulphite.

The process may be safely applied after fixation if the plate is

simply rinsed for a minute or so.

It may be repeated several times if the first application does not give enough density.

^{* &}quot;Commercial pure" strong acid.

Copper Intensifier.

A.	Copper sulphate	 	 100 grs.	230 gms.
	Water	 	l oz.	1000 c.c.s.
В.	Potass. bromide		100 grs.	230 gms.
	Water to	 	 l oz.	1000 c.c.s.

A and B are separately made up with hot water, mixed, and allowed to cool. The negative is bleached in the mixture, and washed for a minute or two. It is then blackened in:—

Silver nitrate45 grs. 100 gms. Water (distilled)1 oz. 1000 c.c.s.

For still greater density, the negative is well washed from silver, and an ordinary developer applied.

If too dense, after the silver, it can be placed in weak hypo solution (about 10 grs. per oz.) or weak potass. cyanide (about 2 grs. per oz.).

Lead Intensifier.

Lead nitrate	 	400 grs.	46 gms.
Potass. ferricyanide	 	600 grs.	70 gms.
Acetic acid	 	3 drachms	20 c.c.s.
Water to	 	20 ozs.	1000 c.c.s

This stock solution will keep for a long time in the dark. The negative is bleached in it, washed once very carefully in 10 per cent. nitric acid—the acid makes the film very tender—then in water, and darkened in:—

A. Sodium	sulphide		 	1 oz.	50 gms.	
Water			 	20 ozs.	1000 c.c.s.	
Or in-						
B. Schlippe'	s salt		 	90 grs.	10 gms.	
Ammoni	B (.880)		 	6 drachms	40 c.c.s.	
Water			 	20 ozs.	1000 c.c.s.	
Or in-						
C. Potass. b	oichroma	ate	 	1 oz.	100 gms.	
Ammoni	a (·880)		 	d oz.	50 c.c.s.	
Water				10 ozs.	1000 c.c.s.	
				intermiferation		

The lead intensifier gives very great intensification, and is suited only for line-subjects.

Uranium Intensifier.

A.	Uraniu	m nitrate		 	100 grs.	23 gms.
	Water			 	10 ozs.	1000 c.c.s.
В.		ferricyanic	le	 	100 grs.	23 gms.
	Water			 	10 ozs.	1000 c.c.s.

The intensifier is prepared from:—A sol., 1 oz.; B sol., 1 oz.; acetic acid, 2 drachms.

The plate must be perfectly free from hypo, and after intensification be washed in several changes of still water until the yellow stain is gone. A 10 gr. per oz. solution of ammonium sulphocyanide removes any yellow stain, and weak ammonia or sodium carbonate removes the intensification altogether, restoring the negative to its original state. A weak acetic acid bath should then be applied to the negative if the intensifier is to be again applied.

NEGATIVE REDUCERS.

Farmer's.

Hypo solution (1:5) 5 ozs. 150 c.c.s. Potass. ferricyanide (10% sol.) .. quant. suff. quant. suff.

The colour is a fair indication of the strength of the reducer; it should be pale yellow, not orange, and should be used weak rather than strong, since its selective action on the shadows of a negative is then less. Yellow stain is due usually to the use of an acid fixing bath, or an old fixing bath, instead of clean plain hypo solution. It is not easy to remove.

Belitski's.

Potass. ferric oxalate	 	150 grs,	10 gms.
Sodium sulphite	 	125 grs.	8 gms.
Water	 	7 ozs.	200 c.c.s.

Dissolve and add-

Oxalic acid.. 40 to 45 grs. 2.5 to 3.1 gms. and shake until the solution turns green. Then pour off from undissolved crystals and add-

Hypo $1\frac{3}{4}$ oz. 50 gms. Instead of the ferric oxalate the following more easily obtainable chemicals can be used in the formula :-

Ferric chloride cryst. 100 grs. 6.5 gms. Potass. oxalate 190 grs. 12.5 gms.

This reducer is stainless, and keeps well in the dark.

Persulphate.

A fresh solution is made at time of use. A drop of sulphuric acid per 2 ozs. makes the action more regular. It is best also to use the reducer before the negative has dried. When sufficiently reduced—indeed, slightly before—the negative is placed at once into 5 per cent, sodium sulphite solution. If much reduction has taken place it is well to fix a second time.

Eder's (Mercury and Cyanide).

70 1 1 17		_
Potassium cyanide	 20 grs.	5 gms.
Potassium iodide	 10 grs.	2 gms.
Mercury bichloride	 10 grs.	2 gms.
Water	 10 ozs.	1000 c.c.s

Reduction takes place slowly and is easy to control.

Dissolve the mercury, then the iodide, and lastly the cyanide to dissolve the red precipitate formed. The solution reduces slowly, but is non-staining.

Iodine-Cyanide,

Iodine (10 per cent. sol. in potass.		
iodide sol.)	30 minims	6 c.c.s.
Potass, cyanide (10 per cent, sol.		
in water)	5 minims	1 c.c.
Water	1 oz.	100 e.c.s.

Bichromate.

Potass. bichromate	 	100 grs.	20 gms.
Sulphuric acid	 	7 drs. (fl.)	40 c.c.s.
Water	 	20 ozk.	1000 c.c.s.

Ceric Sulphate.

Sulphuric acid (sp. gr. 1.98) Water	20 minims 2 ozs.	4 c.c.s. 200 c.c.s.
Dissolve in this— Ceric sulphate	2 ozs.	100 gms.
And dilute to— Water	10 ozs.	1000 c.c.s.

Hard negatives are placed wet in a mixture of this stock solution and nine times its volume of water. Reduces contrasts. Overexposed, long-developed negatives are dipped dry into a mixture of stock solution and an equal part of water and carefully watched as the action is very rapid. A convenient form of the reducer is the stock solution sold by Lumière.

Permanganate.

Potass. permanganate, 10% solu-		
tion	1 dr.	10 c.c.s.
Sulphuric acid (10% solution by	5 drs.	50 c.c.s.
volume of 1.98 acid)		
Water	10 ozs.	1000 c.c.s.

Applied to a wet negative gives even reduction. A dry negative receives greater reduction in the high-lights, and great softening may be obtained by immersing dry negative quickly in the reducer, washing immediately, drying and re-immersing. Any brown stains are removed with a 10% solution of sodium sulphite containing 2% oxalic acid.

Hypochlor and Alum.

Chrome alum	10 grs.	4 gms.
Eau de Javelle	½ oz.	100 c.c.s.
(See "Clearing Solutions")		

Water to make 5 ozs.

Immerse the negative and gently rub the surface with a piece of cotton wool. By confining friction with the wool to certain parts, extra reduction can be obtained.

Eder's Method of Reducing Hard Negatives.

Potass. bichromate		90 grs.	10 gms.
Hydrochloric acid]	l oz. (fl.)	30 c.c.s.
Alum]		50 gms.
Water	9	20 029	1000 ccs

The negative is bleached through to the back in this solution, well washed and redeveloped in any non-staining developer, such as glvcin or rodinal, only up to the right degree of contrast.

Baskett's (Local) Reducer.

It consists of—				
Globe metal	polish	 	 	2d. ti
Terebene .		 	 	2 ozs.
Salad oil		 		2

The ingredients are to be well mixed, and strained through fine muslin two or three times to remove any coarse particles.

NEGATIVE VARNISHES.

not Varnis	hes.	
No. 1. Sandarac	4 ozs.	113 gms.
Alcohol	28 ozs.	800 c.c.s.
Oil of lavender	3 ozs.	85 c.c.s. *
This is a good varnish for retouching	upon, and a	tooth is easil
obtained by rubbing.		
No. 2. Seed lac	2 ozs.	50 gms.
Sandarac	2 ozs.	50 gms.
Oil of lavender	doz.	12.5 gms.
Castor oil	I oz.	25 c.c.s.
	40 ozs.	1000 c.c.s.
To prepare a good surface for the ret	ouching penci	il, the negative
after varnishing is dusted over with fine	resin nowder	and rubbed m

with the fingers.

No. 3.	White ha	ard vari	nish	* 1		15 ozs.	- 150 c.c.s.
	Rectified	spirit	(not	methylat	ed		
	spirit)		`			20 to 30 ozg	200 to 300 c.c.

This will be found a good and cheap varnish if durability is not required, as it is easily rubbed up for retouching upon and easily cleaned off. Very suitable for enlarged negatives that are not to be retained.

No. 4. Bleached	shellac			11	ozs.	62 gms.
Mastic		• •		**	oz.	13 gms.
Oil of tury Sandarac	•	• •	• •		oz.	13 c.o.s. 62 gms.
Alcohol			• •		ozs. (fl.)	1000 c.c.s.

Tough, hard, and durable.

No 5. Sandarac	 	80 ozs.	160 gms.
Turpentine	 	36 ozs.	72 c.c.s.
Oil of lavender	 	10 ozs.	20 c.c.s.
Alcohol	 	500 ozs.	1000 c.c.s.

This one may also be rubbed down with powdered resin, and gives a splendid surface for retouching.

No. 6	. Sandarac	 	 1 oz.	55 gms.
	Seed lac	 	 11 oz.	83 gms.
	Castor Oil	 	 3 drs.	20 c.c.s.
	Oil of lavender	 	 11 dr.	10 c.c.s.
	Alcohol	 	18 ozs. (fl.)	1000 c.c.s

This varnish is somewhat dark in colour.

Methylated spirit.. ..

No. 7. Best orange shellac		2½ ozs.	125 gms.
Oil of lavender or oil	of turpen-		
tine		doz.	13 c.c.s.
Methylated alcohol		20 ozs.	1000 c.c.s.

Keep in a warm place until dissolved; then add a large teaspoonful of whiting or prepared chalk; shake, set aside to clear, and then decant. This is specially recommended for gelatine negatives.

Cold Varnishes.

No. 1. Celluloid	 	 1 oz.	10 gms.
Amyl acetate	 	 50 ozs.	500 c.c.s.

This may be flowed over or applied with a brush to the negative, and requires no heat.

No. 2.	Zanzibar copal	 	6 ozs.	30 gms.
	Amber (fused)	 	1 oz.	5 gms.
	Ether	 	60 ozs.	300 c.c.s.
	Acetone		40 ozs.	200 c.c.s.
	Chloroform	 	4 ozs.	20 c.c.s.
No. 3.	20% shellac solution	 	2 ozs.	160 c.c.s.
	Ammonia (0.880)	 	3 drs.	30 c.c.s.

A mixture of Japanese gold size (1 part) and benzole (2 parts) forms a rather slow-drying though otherwise excellent cold varnish. The surface takes the pencil well.

. 4 ozs.

SHELLAC WATER VARNISH.

Shellac		3 ozs.	100 gms.
Sodium carbonate	(saturated	solu-	
41		24 ozs	800 c.c.s.

The shellac is allowed to soak in the liquid for twenty-four hours; the liquor is then poured away and replaced by an equal quantity of water, and the mixture boiled until the shellac dissolves. After standing some time the liquid becomes perfectly clear and bright.

320 c.c.s.

Film Varnishes.

The	above	water	varnish	is	suitable,	or	the	following:	_
-----	-------	-------	---------	----	-----------	----	-----	------------	---

Borax	 	 6.0	300 grs.	30 gms.
Glycerine	 	 	300 minims	30 c.c.s.
Shellac	 	 	600 grs.	60 gms.
Water	 	 	20 ozs.	1000 с.с.з.

Boil together for about half an hour, then add-

Methylated spirit 5 ozs. 250 c.c.s. and filter.

Another good varnish for celluloid films is-

Dammar	 	 	500 grs.	115 gms.
Benzole	 	 	10 ozs.	1000 c.c.s.

in which, after filtration, the films are immersed and then hung up to dry.

Celluloid in amyl acetate (No. 1 in "Cold Varnishes" above) can also be used and is an excellent varnish for films.

Retouching Medium.

Pale gum resin	 	 200 grs.	230 gms.
Gum dammar	 	 90 grs.	100 gms.
Gum mastic	 	 20 grs.	23 gms.
Oil of juniper	 	 1 gr.	1 gm.
Oil of turpentine	 	 2-4	1000-2000 c.c.s.

The gums are powdered and added to the oils and finally enough pure asphaltum is added to give the mixture a dark amber colour when viewed through the depth of an inch.

This formula is strongly commended by Whiting in his "Retouching" as not liable to pick, rub off, or come off on after-varnishing. It takes a great deal of work.

Ground-Glass Varnish.

Sandarac	 	 90 grs.	103 gms.
Mastic	 	 20 grs.	23 gms.
Ether (0.720)	 	 2 ozs.	1000 c.c.s.

Dissolve the resins in the ether and afterwards add—
Benzole ½ to 1½ ozs. 120-700 c.c.s.

The proportion of the benzole added determines the nature of the matt obtained

This varnish must be applied to the cold negative or the coating will not be matt.

Malachite green, aurantia, or asphaltum is used for tinting it green, yellow, or brown respectively (for handwork on back of negative).

Spotting Medium.

Indian ink	 	 	water colour chalk.
Payne's grey	 	 	water colour chalk.

Grind together with water only on a palette to match the colour of the negative,

Blocking-Out Mixtures.

No. 1. Gamboge and vermilion red, or Payne's grey and vermilion, are ground together in water in equal parts with addition of a little gum water if a glossy surface is required.

No. 2. Asphaltum	 	1 oz.	100 gms.
Wax	 	170 g	
Carbon black	 	80 gr	
Turpentine	 	10 oz	s. 1000 c.c.s.

Commercial "Brunswick black" is equal to and more convenient than the above mixture.

Titles on Negatives.

The usual method is to have the words forming the title set up in type and photographed on a "process" plate. The subject negative having been made with a clear margin round it, a strip of the title negative is laid down on this margin by stripping and the clear margin then filled up with "photopake" or other blocking-out mixture except over the strip of title, which is made dense enough, in the first instance, to print white. If a clear portion in a landscape negative cannot be found (in cases where the title has to appear on the view), a piece must be cut out with a sharp knife.

STRIPPING.

Gelatine Glass Negatives.

(Middleton and Holcroft.)

Stock solution:

Methylated	spirit	 	 25 ozs.	250 c.c.s.
Water		 	 1 oz.	10 c.c.s.
Glycerine		 	 1 oz.	10 c.c.s.

To prepare the "stripping solution" 6 to 30 drops of commercial hydrofluoric acid are added to 1 oz. (30 c.c.s.) of the above. The film is cut through all round about & inch from the edge, and placed level by aid of three wedges. The "stripping solution" is spread with a strip of paper, and the loose edgings of film removed as soon as they come away without any pull whatever. The looseness of the main film is now tested by passing a waxed silk thread, stretched on a bow If all is free, the solution is poured off, and plain underneath it. "stock solution" poured on.

The loose film is now transferred to a glass plate, previously coated with a coating of gum, which should be so thin as to show only when the plate is moistened with the finger. As lifters of the films, " paraffin sheets" (made by soaking thin paper in hot melted paraffin for about half an hour) are used, being semi-transparent and free from buckle. One is laid on the film and lightly squeegeed down. The two

are removed together in contact by slipping the blade of a penknife under the film, which is then applied to the gummed glass plate after flowing the latter with the "stock solution." Again lightly squeegee, and remove the paraffin sheet.

A less rapid solution, but one which will be safe in the case of an old

or hardened negative, is:-

 Methylated spirit
 ...
 1 oz.

 Water
 ...
 ...
 2 ozs.

 Hydrofluoric acid
 ...
 60 minims
 80 c.c.s. 160 c.c.s. 10 c.c.s.

These proportions may be slightly altered for different commercial spirits and acids.

Film Negatives.

 Caustic soda
 ...
 ...
 10 grs.
 23 gms.

 Formaline
 ...
 ...
 10 minims
 20 c.c.s.

 Water
 ...
 ...
 1 oz.
 1000 c.c.s.

The celluloid negative is immersed in this solution until the film shows signs of detachment and can be rolled back with the finger. It is then placed in

 Hydrochloric acid
 ...
 25 minims
 50 c.c.s.

 Glycerine
 ...
 ...
 25 minims
 50 c.c.s.

 Water
 ...
 ...
 1 oz.
 1000 c.c.s.

 Water .. 1000 c.c.s.

in which it is removed from its original support to a glass or other base.

WET COLLODION AND COLLODION EMULSION.

Wet Collodion.

PYROXYLINE (HARDWICH).

Sulphuric acid, 1.845 18 ozs. (fl.) 600 c.c.s. Nitric acid, 1.457 6 ozs. (fl.) 200 c.c.s. Nitric acid, 1.457 5-51 ozs. (fl.) 167-182 c.c.s. Cotton-wool 300 grs. 23 gms.

Temperature, 150 degrees F. (65 degrees C). Time of immersion ten minutes.

IODISED COLLODION.

For Acid Pyro Developer.

Ether, specific gravity 0.725 ... 10 ozs. (fl.) Alcohol, specific gravity 0.805 ... 4 ozs. (fl.) 1000 c.c.s. 400 c.c.s 27 gms. 30 grs. .. 45 grs. 7 gms. Cadmium iodide ... 10 gms. Alcohol (0.830) ... 4 ozs. (fl.) 400 c.c.s.

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BROMO-IODISED COLLODION.

For Iron Developer.

Ether, specific gravity 0.725	 10 ozs. (fl.)	1000 c.c.s.
Alcohol, specific gravity 0.805	 5 ozs. (fl)	. 500 c.c.s.
Pyroxyline	 120 grs.	27 gms.
Ammonium iodide	 40 grs,	9 gms.
Cadmium iodide	 40 grs.	9 gms.
Cadmium bromide	 20 grs.	4.5 gms.
'Alcohol (0.830)	 5 ozs. (fl.)	500 c.c.s.

Thinning Collodion after Use.—A mixture of sulphuric ether (0.720), 3 parts, and alcohol (0.805), 2 parts, is generally used.

THE NITRATE BATH.

Silver nitrate	 6 ozs.	75 gms.
Distilled water	 80 ozs. (fl.) 1000 c.c.s.
Nitric acid (pure) .	 8 minims	0.2 c.c.s.

Saturate with iodide of silver, which may be done by coating a plato with collodion and leaving it in the bath for some hours. Filter.

DEVELOPER.

No. 1. Ferrous sulpha	te	10	7. 5	i0 gms.		
Glacial acetic a	cld	10	7. 5	0 c.c.s.		
Alcohol		10	z. 5	0 c.c.g.		
Water		10	ozs. 1	.000 c.c.s.		
No. 2. Ferrous ammor	nio-sulphate	75	grs. 4	3 gms.		
Glacial acetic a	eid	75		3 gms.		
Copper sulphat	е	7 g		gms.		
Water		40	zs. 1	000 c.c.s.		
Alcohol		10	z. 6	0 c.c.s.		
Intensifier.						
Pyrogallic acid		90	grs. 1	.0 gms.		

 Pyrogallic acid
 ...
 ...
 90 grs.
 10 gms.

 Citric acid
 ...
 ...
 60 grs.
 7 gms.

 Acetic acid (glacial)
 ...
 1 oz.
 50 c c.s.

 Water
 ...
 ...
 20 ozs.
 10 for creating control interpretable control i

The copper intensifier (see "Intensifiers") is used for greater density, each solution being flowed over the plate with a rinse between.

Positives and Ferrotypes by Wet Collodion.

BROMO-IODISED COLLODION.

Ether, specific gravity 0.725	 10 ozs. (fl.)	1000 c.c.s.
Alcohol, specific gravity 0.805	 5 ozs. (fl.)	500 c.c.s.
Pyroxyline	 100 grs.	23 gms.
Cadmium iodide	 50 grs.	11½ gms.
Ammonium bromide	 25 grs.	5.7 gms.
Alcohol, 0.830	 5 ozs. (fl.)	500 c.c.s.

Note.—The iodides should be dissolved in the weaker spirit, and the pyroxyline in the ether and stronger spirit, and the two solutions mixed.

SILVER BATH.

Silver nitrate (recryst.)		5½ ozs. 80 ozs. (fl.)	70 gms.
Distilled water			1000 c.c.s.
Nitric acid (pure)	 	½ dr.	0.8 c.c.

Saturate with iodide of silver and filter as above.

DEVELOPERS.

Ferrous sulphate		150 grs.	34 gms.
Glacial acetic acid		$\frac{1}{2}$ oz.	50 c.c.s.
Nitric acid	*- *	5 minim	s 1 c.c.
Alcohol		½ oz.	50 n.c.s.
Water		10 ozs.	1000 c.c.s.

Note.—By increasing the proportion of nitric acid and decreasing that of the acetic, the image will be more metallic in appearance.

NITBATE OF IRON DEVELOPER.

Ferrous sulphate	 	 13 oz.	75 gms.
Barium nitrate	 	 1 oz.	50 gms.
Water	 	 20 ozs.	1000 c.c.s.
Alcohol	 	 1 oz.	50 c.c.s.
Nitric acid	 	 40 drops	4 c.c.s.

The insoluble barium sulphate which is formed must be filtered out.

FIXING SOLUTION.

Potassium	cyanide	 	OZ.	25-30 gms.
Water		 	15-20 ozs.	1000 c.c.s.

DEVELOPER FOR COLLODION TRANSFERS.

Pyrogallic acid	144	 	4 grs.	9 gms.
Citric acid	414	 	3 gra.	7 gms.
Acetic acid		 	20 minims	41 c.c.s.
Water		 	1 oz.	1000 c.c.s.
Alcohol		 	20 minims	41 c.c.s.

Wet Collodion for Half-Tone.

For Winter.

A. Celloidin	 	190 grs.	21 gms.
Ether (.720)	 	12 ozs.	600 c.c.s.
Alcohol (-805)	 	8 ozs.	400 c.c.s.
	For St	ummer.	

B. Celloidin 190 grs. 21 gms. Ether (.720) 10 ozs. 500 c.c.s.

Alcohol (.805) 10 ozs. 500 c.c.s.

	TODI	ZER.		
Cadmium iodide			600 grs.	68 gms.
Ammonium iodide			210 grs.	24 gms.
Sodium iodide			210 grs.	24 gms.
Cadmium bromide			210 grs.	24 gms.
Alcohol			20 ozs.	1000 c.c.s

Use: Iodizer, 1 part; collodion, 15 parts; and set the mixture aside for at least 4 days to ripen. It should then be a bright yellow; if not, add to each ounce 1 minim of a solution of:—Iodine, 16 grs.; alcohol, 1 oz.

Collodion Emulsion.

PYROXYLINE FOR COLLODIO-BROMIDE OR UNWASHED EMULSION.

 Nitric acid, specific gravity 1:45
 2 ozs. (fl.)
 285 c.c.s.

 Sulphuric acid, specific gravity 1:845
 570 c.c.s.

 Water
 1 cz. (fl.)
 145 c.c.s.

 Cotton (cleaned and carded)
 100 grs.
 33 gms.

Temperature, 150 degrees F. (65 degrees C.). Time of immersion 10 minutes.

FOR WASHED EMULSION.

Nitric acid, specific gravity 1.45. 2 ozs. (fl.) 400 c.c.s Sulphuric acid, specific gravity 1.845 3ozs. 600 c.c.s. White blotting-paper ... 145 grs. 66 gms.

White blotting-paper . . . 145 grs. 66 gms.

Temperature, 100 degrees F. (38 degrees C.). Time of immersion
30 minutes.

COLLODIO-BROMIDE EMULSION.

Ether, specific gravity 0.720 ... 5 ozs. (fl.) 620 c.c.s.
Alcohol, specific gravity 0.820 ... 3 ozs.

Pyroxyline 50 grs.
Cadmium ammonium bromide ... 80 grs.

23 gms.

Zine bromide 76 grs. 21.5 gms.

Sensitise by adding to each ounce 15 grs. of nitrate of silver dissolved in a few drops of water and 1 drachm of boiling alcohol. This is suitable for slow landscape work or for transparencies.

WASHED EMULSION (for Transparencies).

Ether, specific gravity 0.720 ... 5 ozs. (fl.) 620 c.c.s. Alcohol specific gravity 0.820 ... 3 ozs. 380 c.c.s. Pyroxyline or papyroxyline ... 60 grs. 17 gms. Cadmium ammonium bromide ... 100 grs. 29 gms. or

Zinc bromide 96 grs. 27.5 gms. Hydrochloric acid (specific

gravity 1.2) 8 minims 2 c.c.s.

Sensitise with 20 grs. of silver nitrate to each ounce (4.3 grs. to each

Sensitise with 20 grs. of silver nitrate to each ounce (4.3 grs. to each 100 c.c.s.), dissolved in a minimum of water with 2 drachms (13 c.c.s.) of boiling alcohol. Allow to stand for two or three days.

N.B.—In the last formula the emulsion, after being allowed to ripen for the time stated, should be poured into a dish and allowed to become thoroughly dry. The mass of dry emulsion is then washed to remove all the soluble salts, and is then again dried and redissolved in equal parts of ether and alcohol, at the rate of from 20 to 24 grs. to the ounce of solvents.

A. Silver nitrate

WELLINGTON'S COLLODIO-BROMIDE EMULSION FORMULA.

Pyroxyline			30 grs.	23 gms.
LATOXALLIA	 	 		
Ether	 	 	12 drs.	500 c.c.s
Alcohol	 	 	12 drs.	500 c.c.s

To bromise, add 30 grs. (33 gm ·.) bromide ammonium dissolved in 45 minims (31 c.c.s. water), to which 4 drachms (170 c.c.s.) of alcohol are afterwards added; 50 grs. (33 gms.) of nitrate of silver dissolved in a drachm ($\frac{4}{2}$ c.c.s.) of water are then added. After washing and drying, the pellicle is dissolved in 1_{4}^{2} oz. (58 c.c.s.) of ether, and the same of alcohol.

Developer.

An excellent developer for collodion emulsion is the following, worked out by the Bolt Court School of Photo-Engraving, London:—

Glycin	 	 190 grs.	17 gms.
Sodium sulphite	 	 1 oz.	40 gms.
Potass. carbonate	 	2 ozs.	80 gms.
Water to	 	 25 ozs.	1000 c.c.s.

INTENSIFYING SOLUTION FOR COLLODION EMULSION.

Silver nitrate	 	 60 grs.	70 gms.
Citric acid	 	30 grs.	35 gms.
Nitric acid	 	30 minims	35 c.c.s.
Water	 	 2 ozs.	1000 c.c.s.

To each drachm of a three-grain solution of pyrogallic acid add 2 or 3 minims of the above, and apply until sufficient density is attained.

HÜBL'S CHLOR-BROMIDE COLLODION EMULSION.

Special for Colour Work. ... 480 grs.

50 gms.

Hot distilled water	 	l oz.	50 c.c.s.
Dissolve and add			
Alcohol	 	2 ozs.	100 c.c.s.
Nitric acid	 	6 drops	10 drops
Shake well, and add to			
4 per cent. collodion	 	10 ozs.	500 c.c.s.

Shake till any precipitated pyroxyline is redissolved, and then add in small quantities

Zinc bromide (pure a	nhydrous)	307 grs.	32 gms.
Absolute alcohol		24 ozs.	128 c.c.s.
Shaking between each addit	tion; then	add	
271. 1 17		01	1.0

This should be gently warmed before adding to the collodion. Allow to stand for twenty-four to thirty-six hours, or till the emulsion appears a greyish-violet by transmitted light, then add

Zinc chloride (pure anhydrous).. 77 grs. 3.2 gms. or sufficient to convert the whole of the uncombined silver nitrate into chloride, which can be tested for with potassium chromate. It

is advisable to dissolve the zinc chloride in about four times its volume of acid. The emulsion should then be precipitated by pouring into plenty of water, the threads collected and shaken up with alcohol and drained, and then dissolved in

Absolute alcohol	 	 10 ozs.	500 c.c.s.
Ether, washed	 	 10 ozs.	500 c.c.s.

PLAIN AND ALBUMEN PAPERS.

Plain Paper.

Pre	pare the plain paper wit	h—		
	Ammonium chloride		 60-80 grs.	14—18
	Sodium citrate		100 grs.	23 gms.
	Sodium chloride		 20—30 grs.	4.5-7 gms.
	Gelatine		10 grs.	2 gms.
	Distilled water		 10 ozs.	1000 c.c.s.
or—				
	Ammonium chloride		100 grs.	23 gms.
	Gelatine	1.	 10 grs.	2 gms.
	Water		 10 ozs.	1000 c.c.s.

The gelatine is first swelled in cold water and then dissolved in hot water, and the remaining components of the formula are added. The solution is filtered, and, when still warm, the paper floated upon it for three minutes.

The salted paper is sensitised upon a neutral 45-grain silver bath.

PLATINUM TONING BATH.

Potass, chloroplatinite	 4.5 grs.	1 gm.
Water	 10 ozs.	1000 c.c.s.
Nitric acid	 2-3 drops.	5-10 drops.

Albumen Paper.

SILVER BATH.

Silver nitrate	 	 600 grs.	140 gms.
Distilled water	 	 10 ozs.	1000 c.c.s.

The bath is made just acid with nitric acid, requiring three or four drops per 10 ozs.

TONING BATHS.

No. 1. Gold chloride	 	 1 gr.	0.3 gm.
Sodium acetate	 	 30 grs.	6 gms.
Water	 	 8 ozs.	1000 c.c.s.

This must not be used till one day after preparation. It keeps well and gives warm, rich tones.

No. 2. Gold chloride ... 15 grs. 1 gm. .. 4 ozs. 120 c.c.s. Water ..

Add lime water until a piece of red litmus paper, placed in the solution, is turned blue. Then add-

Calcium chloride, fused ... 120 grs. Water to make 73 ozs.

This solution is diluted with 15 times its volume of water to make the toning bath; it can be used over and over again by addition of stock solution.

PRESERVATIVE FOR SENSITISED ALBUMEN PAPER.

Sensitise the paper in the usual bath, drain well, and when superficially dry float the back of the paper for twenty minutes on a solution of-

Citric acid 1 oz. 33 gms. .. 30 ozs. Water ... 1000 c.c.s.

To Prevent Blisters in Albumen Prints.

Before wetting the prints immerse them in methylated spirit, then wash and tone as usual.

GELATINE P.O.P.

Emulsion Formulae.

BARKER'S.

Gelatine (Nelson's No. 1	and		
Coignet's, equal parts)		175 grs.	80 gms.
Ammonium chloride		18 grs.	8 gms.
Rochelle salts		50 grs.	23 gms.
Silver nitrate		75 grs.	34 gms.
Alcohol		4 drs.	160 c.c.s.
Water		5 029	1000 000

Heat to 100 degrees F. (38 degrees C.), and allow to remain at this temperature after all is dissolved for ten minutes, after which proceed in the usual way.

VALENTA'S.

A.	Silver nitrate	 	480 grs.	32 gms.
	Citric acid	 	120 grs.	8 gms.
	Hot water	 	51 ozs.	160 c.c.s.
B.	Gelatine	 	1440 grs.	96 gms.
	Ammonium chloride	 	42 grs.	2.8 gms.
	Water	 	24.3 ozs.	700 gms.
C.	Tartaric acid	 	42 grs.	2.8 gms.
	Sodium bicarbonate	 	21 grs.	1.4 gm.
	Alum	 	27 grs.	1.8 gm.
	Water	 	5 ozs.	140 c.c.s.

Allow the gelatine to swell in the water and melt by the aid of heat, and add the chloride. Mix B and C at 50 degrees C., and in yellow light add A, heated to the same temperature, in small quantities, shaking thoroughly, and allow the emulsion to ripen for a short time at from 40 degrees to 50 degrees C. and then filter. For matt surface papers the gelatine should be reduced to 754 grs. or 80 gms.

The above formula gives vigorous brilliant prints, but for soft negatives a harder printing emulsion is obtained by adding from 0.05 to 0.1 per cent. of calcium bichromate solution; this can be made by dissolving 480 grs. or 25 gms. of pure chromic acid in 4 ozs. or 100 c.c.s. of distilled water, and adding sufficient pure chalk (calcium carbonate) to make the solution cloudy. The solution should then be filtered, and the filter washed with distilled water up to 4 ozs. or

100 c.c.s.

BEADLE'S.

Nelson's ge	elatine		 340 grs.	112 gms.
Alum			 15.5 grs.	5 gms.
Water			 61 ozs.	900 c.c.s.
Rochelle sa	ilts		15.5 grs.	3.5 gms.
Ammoniun	n chloride		 11 grs.	5 gms.
Heat to 50 degree	s C., and a	dd		
Silver nitre	ate		 115 grs.	37.5 gms.
Citric acid			62 grs.	20 gms.
Water			1 oz.	100 c.c.s.

Gold Toning Baths.

SULPHOCYANIDE.

Gold chloride	 2½ grs.	0·3 gm.
Ammonium sulphocyanide	 30 grs.	3.5 gms.
Water	 20 ozs.	1000 c.c.s.

It is necessary for this and all sulphocyanide baths to ripen. The best method fmixing is to boil the water and to dissolve the gold in one half and the sulphocyanide in the other. Then pour the former into the latter, stirring all the time, and use when cool. If cold water is used, the mixture should be allowed to stand 12 hours.

FORMATE.

Gold chloride	 	1 gr.	0·12 gm.
Sodium bicarbonate	 	2 grs.	0.23 gm.
Sodium formate	 	8 grs.	0.9 gm.
Water	 	20 028.	1000 c.c.s.

The prints must be immersed in a 10 % solution of salt and water before using this bath.

TUNGSTATE.

Sodium tungstate	 30 grs.	3.5 gms.
Sodium carbonate	 1 gr.	0·12 gm.
Gold chloride	 1 gr.	0·12 gm.
Water	10-20 029	500.1000 0 0 0

CONCENTRATED SULPHOCYANIDE. (Bühler's Formula.)

A.	Distilled water	 1 oz.	150 c.c.s.
	Gold chloride	 15 grs.	5 gms.
B.	Strontium chloride	 150 grs.	50 gms.
	Distilled water	 3 OZ.	100 c.c.s.
C.	Potassium sulphocyanide	 80-150 grs.	25-50 gms.
	Distilled water	 13 oz.	250 c.c.s.

Heat B to boiling, and add A (heated to 150 degrees F.) in small doses. Bring C to boiling, and allow to cool to 205 degrees F., and add the hot mixture of A and B in four or five lots with constant stirring; cool and filter. If a precipitate forms, reheat to nearly boiling, wash the filter with $\frac{3}{4}$ oz. (100 c.c.s.) water, and add this latter to the total bulk. The bath is diluted with 10 times its volume of water for use.

THIOCARBAMIDE.

		Gold chloride		4 grs.	0 25 gm.
		Distilled water		1 oz.	25 c.c.s.
L	Add,	to dissolve precipitate firs	t formed,	sufficient of-	
		Thiocarbamide		90 grs.	1 gm.
		Distilled water		10 ozs.	50 c.c.s.
E	lbou	t 1 oz. (14 to 15 c.c.s.) wil	l be needed	d. Next add-	-
		Čitric acid		8 grs.	0.5 gm.
8	nd				
		Distilled water to		35 ozs.	1000 c.c.s.
8	nd f	inally			
		Salt		160 grs.	10 gms.
	The	e prints should be thore	oughly was	shed before as	well as after
£		. ~	_ ,		

The prints should be thoroughly washed before as well as after fixing.

SHORT STOP FOR GOLD TONING.

A weak solution of sodium sulphite (5 grs. per oz.) at once arrests the action of a gold toning bath.

SALT BATH.

A short immersion of prints in the following bath prior to the first washing favours even toning and prevents spots and stains from rusty tap water:—

Salt			 	2 oz.	100 gms.
Sodium	carbons	ite	 	1 oz.	50 gms.
Water	* *		 	20 oz.	1000 c.c.s.

If prints are to be toned in the platinum bath the carbonate should be omitted.

Platinum Toning Baths.

PHOSPHORIC ACID.

Potass. chloroplatinite Phosphoric acid (sp. gr. 1·12)	• •	4 grs. 3 oz. (fl.)	0·45 gm. 35 c.c.s.
Water to		20 oz.	1000 c.c s.

CITRIC ACID.

Potass. chloroplatinite	 4 grs.	0 45 gm.
Sodium chloride (salt)	40 grs.	4.5 gms.
Citric acid	 50 grs.	5.8 gms.
Water to	 20 oz.	1000 c.c.s.

HADDON'S FORMULA.

Platinum perchloride	 ***	3 grs.	0.2 gm.
Sodium formate	 	100 grs.	6.5 gms.
Formic acid	 	30 minims	1.8 c.c.
Water to	 	35 oz.	1000 c.c s.

SHORT STOP FOR PLATINUM TONING.

A weak solution of sodium carbonate (10 grs. per oz.) instantly arrests the toning action of a platinum bath.

FOR BLACK TONES.

Tone in— (Valenta.)		
Potass. chloroplatinite		2½ to 10 grs.	
Metaphenylene-diamine		21 to 10 grs.	0.5 to 2 gm.
Water		10 oz.	1000 c.c.s.
having first washed the prints	well.		

Another method is to print deeply and immerse the prints in-

Salt			 1 oz.	25 gms.
Sodium	bicarbonate	:.	 80 grs.	9 gms.
Water			 20 oz.	1000 c.c.s.

then wash well and tone in a borax gold bath to a purple red. Again well wash and tone in the phosphoric platinum bath.

FOR RED.

(Valenta.)

Uranium nitrate	 	 10-20 grs.	1-2 gms.
Thiosinamine	 	 90 grs.	10 gms.
Water	 	 20 ozs.	1000 c.c.s.

The prints are well washed, finally in water acidulated with acetic acid, and then toned. They are afterwards fixed, or can be toned to sepia brown in the combined bath.

GOLD PLATINUM (One Solution).

Citric acid	 	90 grs.	10 gms.
Salt	 	90 grs.	10 gms.
Potass. chloroplatinite		4-8 grs.	½-1 gm.
Gold chloride	 	4-8 grs.	$\frac{1}{2}$ -1 gm.
Water	 	20 ozs.	1000 c.c.s.

Twice the amount of water may be used if the bath acts too quickly. If the proportion of gold to platinum is increased the tone is warmer. The prints must be well washed before fixing.

Combined Baths.

VALENTA'S.

Нуро	8 ozs.	400 gms.
Ammonium sulphocyanide	1 oz.	50 gms.
Lead nitrate	175 grs.	20 gms.
Alum	350 grs.	40 gms.
Water to	20 ozs.	1000 c.c.s.

Dissolve the hypo in the water, add the sulphocyanide, then add the alum dissolved in a little water, and also the lead, and add to the hypo. Heat the mixture to 120° F. for ten minutes; allow to cool. For use take—

Stock solution (as above)		10 ozs.	100 c.c.s.
Water		10 ozs.	100 c.c.s.
Gold chloride (from stock sol	.)	34 grs.	0.23 gm.

ALKALINE TONING AND FIXING BATH.

Gold chlori	de	 	 2 grs.	0.23 gm.
Lead nitrat	te	 	 10 grs.	1.2 gm.
Chalk		 	 d ozs.	25 gms.
Нуро		 	 4 ozs.	200 gms.
Water		 	 20 ozs.	1000 c.c.s.

Shake the solution well, allow to settle, and use the clear portion.

Reducer for Over-Printed Proofs,

A. Ammonium sulphocyanide	 	10% sol.
B. Potass, ferricyanide	 	10% sol.
A, 5 ozs.; B, ½ oz.; water, 24 ozs.		,,,

Developing P.O.P.

DIRECT PROCESS WITH ACID DEVELOPER.

Hydroquinone	 	 16 grs.	18.5 gms.
Citric acid	 	 40 grs.	4.6 gms.
Sodium acetate	 	 1 oz.	50 gms.
Water	 	 20 ozs.	1000 c.c.s.

Immerse the dry prints in the developer, and, after development, wash in plenty of water for ten or fifteen minutes, then tone in the usual way.

Pyro (Blacklock).

	Pyro				 40 grs.	4.6 gms.
	Tartaric	acid			 40 grs.	4.6 gms.
	Water				 20 ozs.	1000 c.c.s.
Wil	keep thi	ree or fo	our wee	ks.		
	D-4 1				2	0.000

B. Potass, bichromate \(\frac{1}{16}\) gr. 0.009 gm. Water 16 ozs. 1000 c.c.s.

B is best made up from a stock solution of 1 gr. per ounce, adding dr. of it to 16 ozs. of water. To develop, mix equal parts of A and B.

Six or seven inches of magnesium ribbon burnt close to the frame will suffice for the exposure.

The fixing bath is :-

Нуро	 	 $3\frac{1}{4}$ ozs.	160 gms.
Lead acetate	 	 200 grs.	23 gms.
Water	 	 20 ozs.	1000 c.c.s.

in which the prints lose very little.

PAGET "BROMIDE" PROCESS.

The prints are immersed in 10 per cent. potass. bromide solution for five or ten minutes, washed and developed with the following:—

Α.	Hydroquinone	 	40 grs.	4.5 gms.
	Sodium sulphite		160 grs.	18 gms.
	Water to		20 ozs.	1000 c.c.s.
В.	Potass. bromide	 	24 ozs.	125 gms.
	Sodium carbonate	 	2 ozs.	100 gms.
	Water to	 	20 ozs.	1000 c.c.s.
C.	Potass. cyanide	 	1 oz.	25 gms.
	Water	 	20 ozs.	1000 c.c.s.

For average negatives, mix:—A, $\frac{1}{2}$ oz.; B, 1 oz.; C, 20 minims; water, $\frac{1}{2}$ oz.

For flat negatives (greater contrast), A, 3 drs.; B, 1 oz.; water, 5 drs.

For hard negatives (soft results), A, 7 drs.; B, 1 oz.; water, 1 dr.

The cyanide solution is used as above in quantity sufficient to keep the backs of prints clean.

Glazing P.O.P.

A polishing medium to be applied to glass or ferrotype before squeegeeing the print is—

Turpentine	• •	• •	• •	20 grs. 1 oz.	45 gms. 1000 c.c.s.
Spermaceti Benzole	wax	• • •	• •	 20 grs. 1 oz.	45 gms. 1000 c.c.s.

a few drops of which are rubbed on with a piece of flannel, and the glass afterwards polished with silk rag or chamois leather.

ENAMEL COLLODION.

Soluble gun cotton	 50 grs.	14 gms.
Alcohol	 4 ozs.	500 c.c.s.
Sulphuric ether	 4 ozs.	500 c.c.s.

Glass plates cleaned with French chalk are coated with the above, and, as soon as coating has set, slip under prints which are waiting face down in water. Prints are withdrawn, squeegeed, and when half dry given a backing paper. (For both gelatine and collodion prints.)

COLLODIO=CHLORIDE P.O.P.

Emulsion Formula.

				(Vale	nta.)		
1.	Strontium	chlor	ride			154 grs.	10 gms.
	Lithium cl	hlorid	e			77 grs.	5 gms.
	Water					500 minims	30 c.c.s.
	Alcohol (a	bsolui	te)			930 minims	55 c.c.s.
2.	Silver nitra	ate				400 grs.	20 gms.
	Water					500 minims	30 c.c.s.
	Alcohol					1000 minims	60 c.c.s.
3.	Citric acid					77 grs.	5 gms.
	Alcohol					675 minims	40 c.c.s.
	Glycerine					92 grs.	6 gms.

In a bottle capable of holding 1000 parts pour 350 parts of 3 per cent. collodion and add gradually 15 parts of No. 1. Then in the dark room add almost drop by drop 60 parts of No. 2, shaking well after each addition; then add 50 parts of No. 3 and 50 parts of ether. This collodion is suitable for normal negatives, but more contrast can be obtained if 0.1 to 0.4 per cent. calcium chromate solution is added. By reducing the amount of pyroxyline in the above formula the emulsion is more suitable for matt surface paper.

Gold Toning Baths.

BORAX-ACETATE.

Borax	 	90 grs.	10 gms.
Sodium acetate	 	90 grs.	10 gms.
Gold chloride Water	 	2½ grs. 20 ozs.	0·3 gm. 1000 c.c.s.
water	 	 20 023.	1000 0.0.8.

SULPHOCYANIDE.

Ammo	nium sulphocya	nide	 90 grs.	10 gms.
Gold o	hloride			0.3 gm.
Water			 20 ozs.	1000 c.c.s.
Was blesich	11-1-4			

SULPHOCYANIDE-ACETATE.

Ammonium sulphocyanide	35 grs.	4 gms.
Sodium acetate	§ OZ.	45 gms.
Gold chloride	5 grs.	0.6 gm.
Water	20 ozs.	1000 c.c.s.

Is made up one hour before using, preferably from stock solutions of the substances. With sodium tungstate, instead of the acetate, gives fine chestnut tones.

The maker's formulæ should be studied in connection with the above baths as papers differ considerably in the quantity of gold required in the toning solution.

Platinum Toning Baths.

The phosphate formula given below under "Gold Platinum Toning" is suitable for the production of the warm brown and sepia tones, which are given by the platinum baths alone. Others are:—

Citric acid Potass chloroplatinite	•••		45 grs. 4 grs.	5 gms. 0·5 gm.
Water			20 ozs.	1000 c.s.
and				
Lactic acid (specific gra	avity	1.21)	25 grs.	3 gms.
Potass chloroplatinite			4 grs.	0.5 gm.
TTT /			20 ozs.	1000 c.c.s.

SALT-BICARBONATE BATH.

The following is used between washing and toning with the patinum bath as a means of removing free silver, and bringing the prints into a state of regular neutrality:—

Salt		 	oz.	25 gms.
Sodium	bicarbonate	 	45 grs.	5 gms.
Water		 	20 ozs.	1000 c.c.s.

Gold-Platinum Toning.

For Black Tones.

Wash in several changes, and tone the shadows to a brown (when seen by transmitted light) in the following:—

Borax	 	90	grs.	10 gms.
Gold chloride	 	2 g	rs.	0.2 gm.
Water	 	20	ozs.	1000 c.c.s.

This bath is ready within a few minutes of mixing. It is conveniently made just before washing the prints. The quantity of borax is adjusted to the working. If the lighter tones disappear, add more borax; if the prints lack brilliance, add gold. After a ten-minute wash, transfer to the platinum bath, which may be strong or weak, the only difference being that a larger number of prints may be treated together in the weaker bath.

Stock solution .-

Potass chloroplatin Phosphoric acid (s		7 gms.
1.12)	 5 drs.	30 c.c.s.
Water to make	 20 ozs.	1000 c.c.s.

This may be made up to 60 ozs. at once, or added little by little to water, as the prints are passed through a few at a time.

The prints are next washed in about eight changes of water (to the fifth or so of which it is well to add a little of bicarbonate of soda to neutralise traces of acid) before fixing,

For Warm Sepia Tones.

The prints are washed in three changes of warm water and placed in :-

Ammonia	 	 1 dr.	6 c.c.s.
Warm water	 	 20 ozs.	1000 c.c.s.

until they become lemon yellow. They are then again washed in three changes of water and toned for about one minute in the gold borax bath above.

For Red Chalk Tones.

The prints are washed in a couple of changes of water and placed for about half an hour (until they become orange-yellow) in :—

Salt	 	 1 oz.	50 gms.
Water	 	 20 ozs,	1000 c.c.s.

After which they are washed for about one minute and toned, for a few seconds only, in the borax bath above.

For Violet Tones.

Print deeply from the negatives and tone until the colour desired is reached in :—

Hydrochloric acid	 	6 ozs.	300 c.c.s.
Gold chloride	 	10 grs.	1.2 gm.
Water to make	 	20 ozs.	1000 c.c.s.

After which wash thoroughly and fix in 5 per cent, hypo. Less acid in the above bath tends to bluish-violet, more to violet purple.

Combined Baths.

Collodion papers, although not generally so suitable for use with the combined bath, may in many cases be toned in it. The Valenta formula (see "Gelatine P.O.P." above) is suitable, also the following (Kurz):—

Water	20 ozs.	1000 c.c.s.
Нуро	5 ozs.	250 gms.
Ammonium sulphocyanide	240 grs.	28 gms.
Alum	70 grs.	7.5 gms.
Citric acid	70 grs.	7.5 gms.
Lead nitrate	90 grs.	10 gms.
Lead acetate	90 grs.	10 gms.
Gold chloride	31 grs.	0.4 gm.

It is turbid when first made, but clears after a few days.

BROMIDE AND GASLIGHT PAPERS.

The following developers are a few only of the standard. The "Makers' Formulæ" should be consulted.

Amidol.

Sodium sulphite	 650 grs.	74 gms.
Potass. bromide	10 grs.	1·2 gm.
Water	20 ozs.	1000 c.c.s.
When dissolved add— Amidol	 50 grs.	5.7 gms.

This developer will not keep more than three days.

See also the formula given under "Negative Developers."
The most convenient and economical method of using amidol developer for bromide papers is to make up a 10 per cent. stock solution of sodium sulphite, and add 5 grs. potassium bromide to each 10 ozs. solution. For use add 4 grs. dry amidol to each ounce stock solution, and dilute with an equal bulk of water.

Metol.

A.	Metol		 	 100 grs.	11.5 gms.
	Sodium su	lphite	 	 2 ozs.	100 gms.
	Potass. bro	mide	 	 12 grs.	1.4 gm.
	Water		 	 20 ozs.	1000 c.c.s.
B.	Potass. car	bonate	 	2 ozs.	100 gms.
	Water		 	 20 ozs.	1000 c.c.s.

For use take 3 ozs. of A and 1 oz. of B.

For gaslight papers use half the quantity of water in above formula.

Metol-Hydroquinone.

Metol		8 grs.	1 gm.
Hydroquinone		30 grs.	3.5 gms.
Sodium sulphite		a oz.	37.5 gms.
Sodium carbonate		3 oz.	37.5 gms.
10% solution of potas	s. bromide	20 minims	2.5 c.c.s.
Water		20 ozs.	1000 c.c.s.

For gaslight papers make up above formula with 10 ozs, of water.

Rodinal.

Rodinal				100-150 minims	6-9 c.c.s.
Water				10 ozs.	300 c.c.s.
10% soluti	on o	f potass.	. brom	ide 20 minims	1 c.c.

Ortol.

A.	Ortol	 	120 grs.	14 gms.
	Potass. metabisulphite	 	60 grs.	7 gms.
	Water	 	20 ozs.	1000 c.c.s
B.	Sodium sulphite	 	4 ozs.	200 gms.
	Potass. carbonate	 	1 oz.	100 gms.
	Potass. bromide	 	20 grs.	2.3 gms.
	Water		20 028	1000 0 0 8

Use equal parts of A and B.

For gaslight papers use half the quantity of water given in this formula.

Ferrous Oxalate.

A.	Sulphate of iron	 	5 ozs.	250 gms.
	Sulphuric acid	 	30 minims	3 c.c.s.
	Warm water to	 	20 ozs.	1000 c.c.s.
В.	Potass. oxalate (neutral)	 	5 ozs.	250 gms.
	Potass. bromide	 		1.2 gm.
	Warm water to	 	20 ozs.	1000 c.c.s.

For use add 1 oz. of A to 4 ozs. of B, not vice versâ.

After development and without washing, immerse the prints for two minutes in acid bath, pour off and repeat.

ACID BATH.

Glacial	acetic	acid	 	1 dr.	6 c.c.s.
Water			 	20 ozs.	1000 c.c.s.

Then wash thoroughly to remove last trace of acid.

Clearing Bath.

To remove yellow stain from bromide prints, the following is suitable:--

Alum (saturated solution)	10 ozs.	1000 c.c.s.
Hydrochloric acid	3 drs.	40 c.c.s.

Reducer for Bromides.

Over-developed prints are best treated in a weak iodine-cyanide reducer made from (A) 10% solution of iodine in potass. iodide and B) 10% potass cyanide solution. Take:—

A	 	 	30 minims	2 c.c.s.
В	 	 	10 minims	0.6 c.c.
Water	 	 	-2 ozs.	60 c.c.s.
A 3 31	 . 3 TO 26	 		

Adding more of A and B if necessary.

Strong Prints from Flat Negatives,

The prints are fully exposed and over-developed, fixed and washed, They are then placed in the following iodine bath until whites are strongly blue, and then fixed for five minutes.

IODINE BATH

Potass. io	dide	 	 30 grs.	7 gms.
Iodine		 	 3 grs.	0.7 gm.
Water		 	 10 ozs.	1000 c.c.s.

If not sufficiently lightened, the print may be washed and the process with bleaching bath and hypo repeated.

Hypo-Alum Toning.

Hot water		 	20 ozs.	1000 c.c.s.
Нуро		 	$2\frac{1}{2}$ ozs.	125 gms.
solve and add-	_			

Diss

Alum A OZ. 25 gms.

This solution should not be filtered, and it works better as it becomes older; it may be strengthened from time to time with a little fresh solution.

The best results are obtained by keeping the bath hot, or as warm as the emulsion will stand, say 100 to 120 degrees F. In this bath prints will tone in 30 to 40 minutes. When this toning bath is to be employed, the use of the alum bath after fixing is absolutely essential. Moreover, the prints should not, in this case, be subjected to a prolonged washing, but should only be slightly rinsed before being dried.

A new bath tends to reduce the prints rather more than an old one. When toned the prints should be placed in a tepid solution of-

Water			 	70 ozs.	1000 c.c.s.
Alum			 	2 ozs.	30 gms.
and then washed	thorou	ighly.			

Sulphide Toning.

A. Ammonium bromide Potass. ferricyanide		100 grs. 300 grs.	11 gms. 35 gms.
Water	 	20 ozs.	1000 c.c.s.
B. Sodium sulphide (pure)	 	300 grs.	35 gms.
Water	 	20 ozs.	1000 c.c.s.

Bleach the fixed and washed print in A solution. Wash for a few minutes in water, and then immerse in B solution until toned. print is then well washed and dried.

Copper Toning.

A.	Copper sulphate	 60 grs.	7 gms.
	Potass. citrate (neutral)	 240 grs.	28 gms.
	Water	 20 ozs.	1000 c.c.s.
B.	Potass. ferricyanide	 50 grs.	6 gms.
	Potass. citrate (neutral)	 240 grs.	28 gms.
	Water	 20 ozs.	1000 c.c.s.

Use equal parts of each. Warm black to red chalk tones are obtained.

Platinum Toning.

Not for Gaslight Prints.

Potass. chloroplatinite	 	12 grs.	0.8 gm.
		6 grs.	0.4 gm.
Citric acid		54 grs.	3.4 gms.
Water	 	6 ozs.	170 c.c.s.

This bath should be made up fresh for use from stock solutions. Gives warm sepia tones, with slight staining of high-lights. For cold sepia tones and absence of staining add 30 minims 10 per cent. solution potassium bromide to above. Wash well after toning.

Uranium Toning.

A. Uranium nitrate Water	 90 grs.	10 gms. 1000 c.c.s.
B. Potass. ferricyanide Water	 90 grs.	10 gms. 1000 c.c.s.

Use equal parts of A and B, and add 20 minims of glacial acetic acid to each ounce of mixture. The prints must be free from hypo. After toning wash in several changes of still water till the high-lights are clear. Washing in running water will remove the toning in patches. Citric acid (10 grs. per oz.) or oxalic acid (5 grs. per oz.) instead of acetic is an aid to pure whites. This bath intensifies the image.

Green Tones.

Vanadium chloride	 	20 grs.	1 gm.
Ferric chloride	 	10 grs.	0.5 gm.
Ferric oxalate	 	10 grs.	0.5 gm.
Potassium ferricyanide	 	20 grs.	1 gm.
Oxalic acid (sat. sol.)	 	21 ozs.	60 c.c.s.
Water to		20 028	1000 0 0 9

Dissolve the vanadium salt in hot hydrochloric acid and a little water. Add the ferric chloride and oxalate to the oxalic acid solution diluted with half the water, then add the ferricyanide dissolved in water, stirring well, and finally the vanadium. Tone till the prints turn blue, and then wash till they are green. Yellowish stain of the whites is removed by a weak (2 grs. per oz.) solution of ammonium sulphocyanide.

Blue Tones.

10% solution ferric	ammonium		
citrate		2 ozs.	10 c.c.s.
10% solution potasi	sium ferri-		
cyanide		2 ozs.	10 c.c.s.
10% solution acetic ac	eid	20 ozs.	100 c.c.s.

The well-washed prints are immersed in this bath until the desired tone is given. Then well wash until high-lights are clear. This bath intensifies the image.

Gold Toning.

Ammonium sulphocyanide	 30 grs.	2 gms.
Chloride of gold	 2 grs.	0·13 gm.
Boiling water	 4 ozs.	110 c.c.s.

. Use as soon as cool. Place the wet print face upwards on a sheet of glass, squeegee into contact, blot off superfluous moisture, and paint the above bath on with a broad flat brush; when the desired tone is reached wash well and dry. This considerably improves the colour of greenish or rusty black prints, and if allowed to act for some time bluish tones are obtained.

Practically all the above toning solutions can be employed for lantern plates.

Line Drawings from Bromide, Gaslight, or P.O.P. Prints.

After outlining the subject in waterproof Indian ink, bleach out the image in—

Thiocarbamide	 	 240 grs.	25 gms.
Nitric acid	 	 4 drs. (fl.)	25 c.c.s.
Water	 	 20 ozs.	1000 c.c.s.

Or in-

Iodine sol. (10 per cent. in potass.		0
iodide sol.)	30 minims	6 c.c.s.
Potass. cyanide (10 per cent. sol.		
in water)	5 minims	1 c.c.
Water	1 0"	700 0 0 0

THE CARBON PROCESS.

Sensitising Solutions.

Potass. bichromate	 1 oz.	35-50 gms.
Water	 20-30 ozs.	1000 c.c.s.
Liquor ammonia (0.880)	 60 minims	6 c.c.s.

A longer immersion in the weaker solution is practically equal to

a shorter one in the stronger bath.

If the tissue is squeegeed on a glass plate after sensitising, light or heavy squeegeeing also modifies its sensitiveness by removing more or less of the solution. If the tissue be squeegeed on to a ferrotype plate, and allowed to dry upon it, the drying may be done in the light of an ordinary room. The face of the tissue is then protected from light, dust and injurious vapours.

The following has been recommended:-

B.	Potass.	bichron	nate	 	1 oz.	20 gms.
	Water			 	50 ozs.	1000 c.c.s.
	Citric a	cid		 	doz.	5 gms.

Liquor ammonia q.s. to change the tint of the solution to a lemon yellow. This bath is suitable for thin negatives, i.e., those lacking in contrasts, and the tissue sensitised in it will keep longer than that sensitised in the former solution. The tissue, however, is much less sensitive, and with vigorous or contrasty negatives, such as are best suited for carbon work, it is apt to yield prints that are hard, through the washing away of the more delicate tones in the development.

Waxing Solutions.

	waxing Solutions.								
For	R CARBO	ON PR	INTS,	OR FOR	REMO	VING	COLLODION	FILMS.	
							s. 10		
		FOR	FLEXI	BLE SU	PPORT	s (Au:	TOTYPE).		
No 2.	Yellow	beeswa	X			60 gr	s. 14	gms. gms. 000 c.c.s.	
			Fixing	g or Ha	rdenin	ng Bat.	h.		
	Num Water (1			••) gms.)00 c.c.s.	

Gelatine Solutions.

For transferring carbon pictures from flexible support to ivory, opal, glass, &c.

Nelson's No. 1 gelatine			1 oz.	50 gms,
Water			1 pint	1000 c.c.s.
Chrome alum, dissolved	in	2 ozs.		
(100 ccs) hot water			12 are	1.4 am

For coating drawing-papers for the single transfer process-

Nelson's No. 1 gelatine .. 1 oz. 50 gms. 1 pint 1000 c.c.s. Water Chrome alum, dissolved in 2 ozs.

(100 c.c.s.) water 20 grs. 2.3 gms.

Apply with a brush.

Note .- In adding a solution of chrome alum to one of gelatine, both solutions should be at a fairly high temperature, 130 degrees to 160 degrees F.

SUBSTRATUM FOR CARBON TRANSPARENCIES.

Nelson's No. 1 gelatine	 	3 oz.	37 gms.
Water	 	20 ozs.	1000 c.c.s.
Potass bichromate	 	12 grs.	1.4 gm.

Well cleaned plates are coated with this and dried, when they are fully exposed to light, which will render the coating insoluble.

To Remove Bichromate Stains from the Fingers and Nails after Sensitising.

Apply dilute ammonia to the parts until the stains disappear, then well wash the hands with warm water and soap.

THE BROMOIL PROCESS.

C. Welborne Piper's Formula.

The bromide enlargement must be fully exposed and developed using a slow acting amidol developer for preference, and it must be thoroughly fixed, washed, and dried. It is then bleached in-

Ozo	brome soluti	ion	 	 	4 parts
	ash alum, 10			 	4 parts
	ric acid, 10%	solution	 	 	1 part
Wa	ter to make		 	 	20 parts

It is washed and then immersed in sulphuric acid (1 part to 20 water) for from 2 to about 5 minutes, again washed by soaking for a few minutes, and then fixed for 2 or three minutes in-

Нуро	 	 	 2 ozs.
Soda sulphite	 - 1	 	 doz.
Water to make	 	 	 20 ozs.

After this it is washed again and then pigmented like an ordinary oil print. The solutions and washing water used should not be under 60 deg. or over 70 deg. F., and the preparation of the print should not occupy longer than 20 minutes.

The ozobrome solution used is that specially supplied for bromoil by

the Ozobrome Company.

PLATINUM PRINTING.

Sensitisers for Cold Bath Papers (Hübl).

STOCK SOLUTIONS.

Standard Iron Solution.—In glass measure about 3 ins. diameter and 12 ins. high (marked to show a volume of 85 c.c.s.), place 52 gms. powdered iron ammonium alum, and add about 20 c.c.s. ammonia (0.880) and 20 c.c.s. water. Stir up the alum powder with a glass rod, and allow to stand several minutes, with frequent shaking. The whole should smell slightly of ammonia; if it does not a little more is added. The measure is then filled with water, the precipitate of ferric hydroxide stirred up, the glass rod removed, and the ppt. left to settle. The clear liquid is poured off, fresh water poured on, and the stirring and settling repeated until the solution no longer colours red litmus-paper blue. Powdered oxalic acid (21.5 gms.) is then dusted on the ppt., after pouring off the last washing water, and (in yellow light from this point) stirred in until the mixture clears. It is poured into a 100 c.c. measure, and diluted (with rinsings from the cylinder) to 100 c.c.s. Process occupies three to four hours.

Lead-Iron Stock Solution.—Dissolve lead acetate (10 gms.) in warm water (100 c.c.s.), and add oxalic acid (4 gms.) dissolved in a little water. A white precipitate of lead oxalate is produced, and is filtered, washed, and shaken up, with Standard Iron Solution in proportion of 1 gm. per 100 c.c.s. Finally, filter.

Oxalic-Gelatine Solution. — Soak gelatine (2 gms.) in water (20 c.c.s.), and add oxalic acid ($\frac{1}{2}$ gm.). Warm before use. Keeps only a day or two.

Stock Platinum Solution.—Potash chloroplatinite, 1 gm.; water, 6 c.c.s.

Mercury Citrate Solution.—Dissolve yellow mercuric oxide (1 gm.) in water, 20 c.c.s.; citric acid, 5 gms., warm and filter.

SENSITISERS.

The quantities are for a 20 by 30 sheet. Water is added for medium (2 to 3 c.c.s.) and for rough (3 to 8 c.c.s.) papers.

For black tones on gelatine-sized Rives papers.

For blue-black tones on arrowroot-sized papers.

For more brilliant prints 5 to 10 drops of 10% solution of sodium chloroplatinate are added to either of the above.

Sepia Paper Sensitisers.

HOT DEVELOPMENT.

Standard iron solution	 6 c.c.s.
Stock platinum solution	4 c.c.s.
Mercuric chloride (1-20 solution)	0.2 to 1 c.c.
Sodium chloroplatinate (10% solution)	 2 to 10 drops.

COLD DEVELOPMENT.

Standard iron solution	8 c.c.s.
Stock platinum solution	4 c.c.s.
Mercury citrate solution	1 to 4 c.c.s.
Sodium chloroplatinate (10% solution)	 2 to 5 drops.

For rough papers 2 to 4 c.c.s. of water are added.

Cold Bath Developers.

Potass. oxalate	 	2 ozs.	100 gms.
Potass. phosphate	 	1 oz.	50 gms.
Water	 	20 ozs.	1000 c.c.s.

FOR SEPIA TONES ON COLD BATH BLACK PAPER.

. A.	Potass. oxalate Water	• •	** .	 2 ozs. 15 ozs.	20 gms. 150 c.c.s.
	Potass. citrate Citric acid			 160 grs. 250 grs.	23 gms. 39 gms.
	Mercuric chlori Water	de	• •	 95 grs. 15 ozs.	14 gms. 1000 c.c.s.

Equal parts of A and B, used slightly warm. The prints are afterwards fixed in acid baths of one-third the usual strength.

Another Formula.

Pre	oare the following	solutio	ns:-		
	Potass. oxalate			4 ozs.	250 gms.
	Distilled water			 16 ozs.	1000 c.c.s.
2.				124 grs. 8 ozs.	35 gms. 1000 c.c.s.
3.	Mercuric chloride Distilled water	• •	• • •	1 oz. 16 ozs.	62 gms. 1000 c.c.s.
4.				32 grs.	18 gms. 1000 c.c.s.

Mix 12 parts of No. 1 with 4 parts No. 2, then add 4 parts No. 3 and 1 part No. 4, and heat till the precipitate first formed is redissolved. The solution should be heated to 175 degrees F., and the prints developed in it in the usual way and treated to the usual acid clearing baths, then immersed in ammonia solution (about 10 minims per oz.) for five minutes, and washed and dried.

Developers for Sepia Paper,

		ATH	

Potass. oxalate				2 ozs.	100 gms.
Potass. phosphat	e			l oz.	50 gms.
Citric acid				180 grs.	20 gms.
Potass. chloride				90 grs.	10 gms.
Water				20 ozs.	1000 c.c.s.
		COLD	BATH		

Potass. oxalate		 	Z to b ozs.	100 to 300 gm
Oxalic acid		 	90 grs.	10 gms.
Water		 	20 ozs.	1000 c.c.s.
or,				
Potass. oxalate		 	1 to 6 ozs.	70 to 300 gm
Potass. phospha	te	 	260 grs.	30 gms.
Oxalic acid		 	90 grs.	10 gms.
Water		 	20 028.	1000 c.c.s.

RECOVERING OVER-EXPOSED PRINTS.

Immerse for about two minutes in the oxalate developer. Transfer for one second to a bath of 1 to 20 hydrochloric acid. Return to the developer, and treat as usual.

INTENSIFIER FOR PLATINUM PRINTS.

Α	Sodium fo	rmata			45 grs.	100 gms.
21.	Water				1 oz.	1000 ghis.
				 	1 02.	
В.	Platinum	perchlo	ride	 	10 grs.	1 gm. 45 c.c.s.
	Water			 	l oz.	45 c.c.s.

Add 15 minims each of A and B to 2 ozs, of water (3 c.c.s. to 100 c.c.s.).

RESTORING YELLOWED PRINTS.

Shake up bleaching powder with about five times its weight of water, pass through a sieve, and to the portion which passes through add a little weak hydrochloric acid—enough to give the mixture a faint chlorine smell. The solution removes the yellow (iron) stain from platinum prints.

CLEANING SCILED PRINTS.

Alum (one teaspoonful) is dissolved in about 8 ozs. of water, and mixed in a basin with a handful of flour to a cream-like consistency. This mixture is applied to the platinum print with a soft brush, and washed off in running water.

PLATINUM RESIDUES.

Exhausted developers—the acid baths will not repay recovery—are mixed in a large jar, with zinc and hydrochloric acid (spirits of salt will do). A dirty chalk-like precipitate is accumulated, and the clear liquor is thrown away. The platinum is precipitated in the mud, and the latter, when enough has accumulated, is sent to the refiners, after being drained from water as much as possible on a linen cloth.

Waste prints, clippings from paper, etc., should be sent as they are or burnt to an ash in a place free from draught, such as a biscuit tin with a row of holes about half way up. They should not be mixed with the wet residues, as the two require different treatment for the extraction of the metal.

IRON PRINTING PROCESSES.

Ferro-Prussiate Sensitiser.

A.	Ferric	ammoni	um	citrat			
	(green)	٠			. 110 grs		
	Water				. 1 oz.	1000 c.c.s	
В.	Potass. fe	rricyanide			. 40 grs.	90 gms.	
	Water				. 1 oz.	1000 c.c.s.	
Mix	in equal	parts, keep	in th	e dark,	and filter	just before use.	

Solution for Writing Titles on, removing blue lines from blue prints, etc.—Potass. oxalate, 75 grs. per oz.; 170 gms. per 1000 c.c.s.

Brightening the Colour.—Blue prints are improved in colour by a final bath of $2\frac{1}{2}$ per cent. alum solution, 3 per cent. oxalic acid, or 1 per cent. hydrochloric acid.

The Kallitype Process.

Distilled water 1 oz. 1000 c.c.s.

The ferric oxalate is shaken up with the hot water and a grain or two of oxalic acid added to get it into solution. After filtering the silver is added and the solution stored in the dark.

DEVELOPERS.

~	AU 1 ALLO.	r au res	3.6	
Fo	r Black	c To	nes.	
Borax			2 ozs.	100 gms.
Rochelle salt			1; ozs. 20 ozs.	75 gms.
				1000 c.c.s.
Potass. bichromate sol.	(1%)		15 to 18 drs.	90 to 115 c.c.s.
For	Purple	To:	nes.	
Borax			doz.	28 gms.

Borax	 doz.	28 gms.
Rochelle salt	 2 ozs.	100 gms.
Water	 20 ozs.	1000 c.c.s.
Potass. bichromate sol. (1%)	 15 to 18 drs.	90 to 115 c.c.s.

^{*} If the ordinary brown citrate be used, the formula should contain 80 grs. (188 gms.). and the ferricyanide should be increased to 60 grs. (137 gms.).

For Sepia Tones.

Rochelle salt . . . 1 oz, 50 gms.

Water 20 ozs. 1000 c.c.s.

Potass bichromate sol. (1 %) . . 8-10 drs. 50-60 c.c.s.

For Black Tones.

From this developer prints must be passed into a bath of potass. oxalate (15 %) before fixing.

FIXING SOLUTION.

Hypo 1 oz.

Ammonia (0.880) 120 minims 200 gms. 12 c.c.s. Water 20 ozs. 1000 c.c.s.

Sepia Paper.

A.	Ferric ammoni	a citrate	e (gree	n)	110 grs.	250 gms.
	Water				1 oz.	1000 c.c.s.
В.	Tartaric acid				18 grs.	40 gms.
	Water				1 oz.	1000 c.c.s.
C.	Silver nitrate				45 grs.	100 gms.
	Water				1 oz.	1000 c.c.s.
D.	Gelatine				30 grs.	70 gms.
	Water				l oz.	1000 c.c.s.

Equal parts (say 1 oz. of each) of these solutions are mixed as follows:-D is rendered just fluid on a water bath, A and B added, and lastly C, a few drops at a time. The prints are fixed in 1: 50 hypo.

One-Solution Sepia Sensitiser.

.. .. 55 grs. 3.5 gms. 4-5 drs. 15-20 c.c.s. Silver nitrate

Add ammonia drop by drop to just redissolve the white precipitate. and then a little sulphuric (or citric) acid to just remove the odour of ammonia. Then add-

Ferric ammonium citrate (green) 40 grs. 2.5 gms. Water ... 6 drs. 25 c.c.s.

This solution keeps in the dark, and is used like the four-solution mixture.

Pellet Process.

A. Pure gum arabic	4 ozs.	200 gms.
Water	20 ozs.	1000 c.c.s.
B. Ferric ammonium citrate	10 ozs.	500 gms.
Water	20 ozs.	1000 c.c.s.
C. Ferric chloride (crystallised)	10 ozs.	500 gms.
Water	20 ozs.	1000 c.c.s.
Add 8 vols. of B, then 5 vols. of	C to 20 vols. of A,	in small doses
th constant stirring.		

The prints are developed on 10 per cent. solution of potass ferrocyanide and "fixed" in 1: 25 sulphuric acid (specific gravity 1.98).

The Ferro-Gallic Process.

		No.			
Gum arabic				60 grs.	
Warm water				l oz.	1000 c.c.s.
When dissolved add	the f	ollowing	in	the order	given:-
Tartaric acid				8 grs.	18 gms.
Salt				36 grs.	81 gms.
Ferric sulphate				. 40 grs.	90 gms.
Ferric chloride	* 10			. 60 grs.	135 gms.

The developer for the prints is:—Alum and gallic acid, 1 part of each; water, 80 parts.

MOUNTANTS.

Starch Paste.

Pure starch is mixed with a very small proportion of cold water to form a very stiff mass. It should be so stiff that it is stirred with difficulty. Perfectly boiling water is then poured in, about 12 ozs. for every ounce of starch. On stirring the mixture will jellify without being boiled; but if it does not it is brought to the boil, cooled, the skin taken off, and the paste used on day of making.

Gelatine.

For mounting prints without cockling.

Ne	lson'	s No. 1 g	elati	ine .		. 4	ozs.		50 g		
W	ater					. 16	ozs.		200	c.c.s.	
ften	the	gelatine	in	the	water,	liqu	efy on	the	water	bath,	and

add a little at a time and stirring rapidly:

Methylated spirit . . . 5 ozs. 30 o.c.s.
Glycerine 1 oz. 6 c.c.s.

The mountant is used hot. A piece of ground glass is dipped in hot water, drained, and the mountant brushed over. The print is then laid face up on the pasted surface and rubbed gently in contact with a piece of paper, being then removed and pressed down on its mount.

Dextrine Paste.

Best white dextrine	 	 1 lb.	

Cold water to make stiff paste

Water 10 ozs. Oil of wintergreen 1 dr.

Mix the dextrine and water together in small doses of each, so as to ensure a mixture free from lumps and clots. Dilute with the further quantity of water, add the oil, and just bring the whole mixture to the

boil, when it should be like clear gum. Pour into pots, cover up, and in from 12 to 24 hours it will be set to a hard and white paste of great adhesive power. The dextrine must be the best white; inferior dextrine remains treacly on cooling.

Starch-Gelatine.

A. Bermuda arrowroot	8 ozs.	200 gms.
Water	4 ozs.	100 c.c.s.
B. Nelson's No. 1 soft gelatine Water	360 grs.	10 gms. 800 c.c.s.

The gelatine is first softened in the water and A and B are then mixed together and boiled for a few minutes. To the cold mixture are stirred in—

Methylated spirit			5 ozs.	250 c.c.s.
Carbolic acid (liquid)			25 minims	3 c.c.s.
is is a good cold noste	which	etioke	and keeps for	irly wall

Liquid Gelatine.

Gelatine	 	 1 oz.	100 gms.
Water	 	 6 ozs.	600 c.c.s.
Chloral hydrate	 	 l oz.	100 gms.

The gelatine is dissolved in the water by aid of heat, and the chloral hydrate added. After digesting for a short time the adhesive liquid is neutralised with a little sodium carbonate solution.

Gum-Dextrine.

Picked white gum arabic	1 oz.	65 gms.
Dextrine	Ž į ozs.	280 gms.
Liquid ammonia	4 drops	50 c.c.s.
Carbolic acid	1 dr.	15 c.c.s.
Water	8 078	1000 c.c.s.

The gum is powdered in a mortar and mixed intimately with the dextrine, and rubbed with 2 ozs. of water until a smooth mixture is obtained. The remainder of the water is added, and the whole boiled for 10 minutes. The ammonia and carbolic acid are added when cold. This mountant keeps well for months, and is smooth in working and of great adhesiveness.

Shellac Mountant.

A strong solution of shellae in methylated spirit, or, better, rectified spirit, is thinly applied to both mount and print, and the two coated surfaces quickly rubbed into contact. A good method of fixing prints to thin mounts in albums, etc.

Affixing Paper to Metal.

Tragacanth Gum arabic Water	• •	• •	3 ozs. 12 ozs. 50 ozs.	60 gms. 240 gms. 1000 c.c.s.
or— Gum arabic	• •	-		
Aluminium sulphate		• •	1 oz. 45 grs.	100 gms. 10 gms.
Water			10 028.	1000 c.c.s

Mounting on Glass (Opalines).

Nelson's	No. 2	soft gel	atine	 2 ozs.	30 gms.
Water	0, 0			 20 ozs.	300 e.c.s.

The gelatine is soaked in the water, and liquefied by standing the vessel in hot water. The solution is thinned down until nearly as thin as water. Print and glass are immersed, removed together, and squeegeed together with flat rubber squeegee.

WORKING UP, COLOURING, ETC., PRINTS.

Lubricant for Burnishing Prints.

Powdered	Castile	soap	 	20 grs.	5 gms.
Alcohol			 	10 ozs.	1000 c.c.s.

Encaustic Paste.

Purified beeswax	 	 	 50 parts
Oil of lavender	 	 	 30 parts
Benzol	 	 	 30 parts
Gum elemi	 	 	 1 part

BASKETT'S FORMULA.

To the contents of a 2d. tin of Globe polish add 1 oz. best olive oil and 1 oz. terebine. Apply with soft cloth and polish.

Preparing Prints for Colouring.

P.O.P.'s AND GLOSSY BROMIDES.

Rub the prints lightly with a tuft of wool slightly moistened with artist's purified ox-gall. If they have been lubricated before burnishing apply previously a little alcohol in the same way.

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COLLODION PRINTS.

Fluid ext	ract of	quillais	h	1 dr.	5 c.c.s.
Water				1 oz.	40 c.c.s.
Alcohol				1 oz.	40 c.c.s.

BROMIDES.

For Water Colouring.

Apply ox-gall as directed for P.O.P., or prepare as directed below for pastel work.

For Oil Colouring.

If the surface is clean no preparation is needed; if otherwise give a wash of gum, starch, or gelatine, or prepare with pumice powder. Also light drying oil (from the artists' colourman) may be rubbed over with a tuft of wool or the fingers. It dries in about twenty-four hours, and leaves the surface of the bromide ready for painting.

For working up in pastel or black and white, apply fine pumice powder with a tuft of wool, and remove with another piece of wool or

a duster.

Fixatif for Crayon and Pastel Work.

					4 grs.		1.6 gm.
Amyl acetate				3	ozs.		85 c.c.s.
Dissolve by agitation,	and	allow	to	stand	some	hours	before use.
D C-11-1-13 /6111-		6	£				

B. Celluloid (film clippings free from

Aureolin.

emulsion w ll do) . . . 7 grs. 0 45 gm. Amyl acetate 3 ozs. 85 c.c.s.

Dissolve by agitation. Mix when both are clear, and keep in tight'y-corked bottle. Apply with spray diffuser.

Colouring Prints with Dyes.

Dissolve the aniline colour (1d. packets of dye will do) in a sufficient quantity of water (from $\frac{1}{2}$ to 1 oz. to a 1d. packet), and for glossy prints add a little gum. If the work affects the gloss when finished, rub the print over with a piece of wool slightly moistened with a solution of wax in benzole.

Colouring Prints with Artists' Water Colours.

The following are suitable colours: those in italics are transparent, the others are semi-transparent, and all are practically permanent. They are mentioned in the order of their usefulness, viz.:—

Alizarin Crimson. Olive Green. Alizarin Yellow. Raw Sienna. Cobalt Blue. Burnt Sienna. Burnt Carmine (Purple Lake). Bistre. Madder Brown. Purple Madder. Alizarin Green. Viridian Green. Payne's Grey. Sap Gicen Prussian Blue. Sepia.

The following are also useful, but either cannot be classed as permanent colours (marked *) or are not transparent (marked *):— Carmine†; Light Red*, Pink, Rose, and Rose Doré Madders†; Scarlet Lake*, Ultramarine or French Ultramarine*, Indigot, Brown Pink†, Burnt Umber*, Vandyke Brown*, Gamboge†, Naples Yellow, *Yellow Ochre*.

N.B.—The quality and names of the different makers vary. The foregoing lists refer to those colours manufactured by Messrs. Reeves and Sons, Ltd., and of "Artists' Quality."

Spotting Bromide Prints.

Mix together Payne's grey and Indian ink (the colour should match that of the film).

Spotting P.O.P. Prints.

Add a little carmine to the above. When mixture is dry (on the palette) work in a strong solution of gum, rubbing the brush one way only, to avoid making air-bells. If the prints are to be enamelled or glazed by stripping after spotting, then artists' oil colours with benzole in which gum dammar has been dissolved, or water colours, may be used with shellac water varnish. (See "Negative Varnishes.")

Colouring from Behind (Crystoleum).

The print (which should be albumen) is mounted with a warm solution of:-

Hard gelatine 20 grs. 45 gms.

Water 1 oz. 1000 c.c.s.

containing a little salicylic acid to keep it. Or with a cold mountant made by mixing the above with an equal volume of starch paste.

VARNISH FOR "TRANSLUCING."

Canada balsam	 	 5 ozr.	100 gmg.
Solid paraffin	 	 2 ozs.	40 gms.
White wax	 	 2 ozs.	40 gms.

which is melted, the picture immersed, and the whole kept as cool as possible consistent with remaining fluid.

MISCELLANEOUS FORMULÆ.

Reversed Negatives by Ammonium Persulphate.

A lantern or other thinly coated slow plate is placed in contact with the negative in a printing frame and a full exposure given such as would be thought advisable in making a soft positive transparency. The plate is developed with a clean working developer (e.g., glycin)

until the shadows appear quite black on the glass side of the plate. The time of development may be five times as long as for an ordinary transparency. The latter is then washed and placed in a 2 per cent. solution of ammonium persulphate until the silver image is seen to be removed. The plate is then thoroughly washed and developed in any clean developer containing about half a grain of bromide per ounce. It is then fixed and washed and dried. After the first development the operations may be done in weak daylight or artificial The action of the persulphate should be as complete as possible, otherwise a veil is left over the negative. The above is a very rapid and economical process. Direct positives, but reversed from right to left, from engravings, etc., may be made in the camera by substituting bromide paper for the plate. The exposure should be full and the development as above. The method has this advantage, that the lines are rendered in the same degrees of black and grey as in the original, a point of some importance, since the lines in an engraving are seldom, if ever, of unitorm blackness.

To Recover Fogged Plates.

Potass. bichromate .. 100 to 200 grs. 11 to 22 gms. Hydrochloric acid .. 30 minims 3.5 c.c.s. .. 20 ozs. Water 1000 c.c.s.

Bathe plates in above for two minutes, wash for one or two minutes in running water, and dry. Solution slows plates, and may be used, as above or after exposure, to obtain contrast on extra-rapid plates-e.g., when copying black and white or other subjects.

Backing Dry Plates.

1 oz.

100 c.c.s.

Gum solution (ordinary office

gum)

Caramel Burnt sie					1 oz. 2 ozs.	100 gms. 200 gms.
Mix and add-		,				
Alcohol					2 ozs. (fl.)	200 c.c.s.
	BACI	KING S	HEETS	FOR	DRY PLATES.	
Gelatine					1 part	50 gms.
Water					2 parts	100 c.c.s.
Glycerine						50 c.c.s.
Indian in	k				A small ad	dition.

Make a paste, and coat strong paper; place the prepared material face downward- on waxed glass to set. Press to back of plate before putting into dark slide.

The Dusting-on Process.

	-			
Best gum arabic			80 grs.	5.2 gms.
White sugar			60 grs.	4·0 gms.
Ammonium bichromate			60 grs.	4.0 gms.
Water		• •	7 ozs.	200 c.c.s.
Methylated spirit			l oz.	30 c.c.s.

This mixture will keep for a few days only, and after the plate has been coated and exposed it is developed with finest graphite powder, collodionised, and washed.

Ink for Rubber Stamps.

Aniline red (violet)			900 grs.	210 gms.
Boiling distilled water	4 0		10 oz.	1000 c.c.s.
Glycerine		about	4	60 c.c.s.
Treacle		about	+ OZ.	30 c.c.s.

Invisible Ink.

Chloride of cobalt	 25 grs.	60 gms.
Distilled water	 1 oz. (fl.)	1000 c.c.s.

Writing executed with this ink is first pink on paper, becoming invisible on drying. On warming the writing turns blue.

Dead Black for Wood.

Borax			3	ou grs.	8 gms.	
Glycer	ine		3	0 minims	8 c.c.s.	
	c		6	0 grs.	16 gms.	
Water			8	ozs.	1000 c.c.s.	
Boil till dis	ssolved and add-	_ ,				
Nigros	ine, W.S		6	0 grs.	16 gms.	
	e wood first wit					
Cupric	chloride		7	75 grs.	75 gms.	
Potass	ium bichromate		7	5 grs.	75 gms.	
Water			2	d ozs.	1000 c.c.s.	
and as soon a	is the surface dr	ies apply		-		
Aniline	e hydrochlorate		1	50 grs.	150 gms.	
Water			2	24 ozs.	1000 c.c.s.	
and wipe off	any yellow pow	der that	form	s. Repeat	the process	till
	, and then rub					

Waterproofing Solution for Wood.

Asphalt	 	 4 ozs.	400 gms.
Pure rubber	 	 30 grs.	6 gms.
Mineral naphtha	 	 10 ozs.	1000 c.c.s.

Apply with a stiff brush and give three successive coats, allowing to dry between each. The vapour from this solution is very inflammable.

Polish for Cameras, Woodwork, etc.

Linseed oil	 20 ozs.	400 c.c.s.
Spirits of camphor	 2 ozs.	40 c.c.s.
Vinegar	 4 ozs.	80 c.c.s.
Butter of antimony	 1 oz.	20 gms.
Liquid ammonia	 $\frac{1}{4}$ oz.	5 c.c.s.
Water	 1 OZ.	5 c.c.s.

This mixture is applied very sparingly with a bit of old flannel, and thoroughly rubbed off with soft rags.

Blackening Brass Work.

A.	Copper nitrate	 	 200 grs.	450 gms.
	Water	 	 l oz.	1000 c.c.s.
В.	Silver nitrate	 	 200 grs.	450 gms.
	Water	 	 1 oz.	1000 c c s

Mix A and B, and place the brass work (perfectly cleaned) in the solution for a few moments, heating it on removal.

Varnish for Brass Work. .

Celluloid	 	10 grs.	4 gms.
Amyl alcohol	 	$\frac{1}{2}$ OZ.	100 c.c.s.
Acetone	 	½ oz.	100 c.c.s.

Instead of this cold celluloid varnish, commercial "cold lacquer" can be used.

To Blacken Aluminium.

Clean the metal thoroughly with fine emery powder, wash well, and immerse in-

Ferrous sulphate	 1 oz.	80 gms.
White arsenic	 1 oz.	80 gms.
Hydrochloric acid	 12 ozs.	1000 c.c.s.

Dissolve and add-

Water 12 ozs. 1000 c.c.s.

When the colour is deep enough dry off with fine sawdust, and lacquer.

Silvering Mirrors (Martin's Method).

(11 that

n e	n	i ployin g the following f	ormula	, it	should be wel	l understood
		the glass plate to be si	lvered r	nusi	be scrupulous	sly clean.)
A		Nitrate of silver			175 grs.	40 gms.
		Distilled water			10 ozs.	1000 c.c.s.
B		Nitrate of ammonium			262 grs.	60 gms.
		Distilled water			10 ozs.	1000 c.c.s
C		Pure caustic potash ,			l oz.	100 gms.
		Distilled water			10 ozs.	1000 c.c.s.
D	١,	Pure sugar candy			½ oz. (avoir.	
		Distilled water			5 ozs.	1000 c.c.s.
Di	S	solve and add—				
		Tartaric acid				23 gms.
B	oi	l in flask for ten minute	es, and	whe	n cool add-	
		Alcohol			1 oz.	200 c.c.s.
D	18	tilled water, quant. suff	. to ma	ke u	p to 10 ozs. o	r 2000 c.c.s

For use take equal parts of A and B. Mix together also equal parts of C and D, and mix in another measure. Then mix both these mixtures together in the silvering vessel, and suspend the mirror face downwards in the solution.

DEVELOPING FORMULÆ, ETC., OF THE PRINCIPAL PLATE AND PAPER MAKERS.

In all cases, except where otherwise specified, crystallised sodium sulphite and carbonate are to be used.

AUSTIN EDWARDS, LTD.

"Ensign" Flat and Roll-Films.

PYRO DEVELOPER.

A. Pyro	 l oz.	12.5 gms.
Nitric acid	 20 drops.	10 drops.
Or—	4	1
Potass. metabisulphite	 100 grs.	2.8 gms.
Water	 	1000 c.c.s.
B. Soda carbonate crystal	 9 ozs.	112.5 gms.
Soda sulphite	 10 ozs.	125 gms.
Potass. bromide	 80 grs.	2.3 gms.
Water	 80 ozs.	1000 c.c.s.
For use, take A, 1 part: B, 1 part.		

BAYER CO., LTD.

Bayer Bromide Paper.

A.	Edinol (cryst.)		48 grs.	10 gms.
	Soda sulphite (cryst.) Potass. bromide	• •	1 oz. 5 grs.	100 gms. 1 gm.
	Water		10 ozs.	1000 c.c.s.
			25 ozs.	
D.	Potass. carbonate cryst		50 ozs.	250 gms. 500 c.c.s.
	Water		50 0Z8.	Joo C.C.S.

For use, take 4 ozs. A; 1 oz. B; and 5 ozs. water,

"Pan" Paper.

Water	 10 ozs.	1000 c.c.s.
Sodium sulphite (cryst.)	1½ oz.	125 gms.
Hydroquinone	72 grs.	16 gms.
Sodium carbonate (cryst.)	2½ ozs.	250 gms.
Potass. bromide	 48 grs.	11 gms.

"Tula" and "St. Luke's" Papers.

Potass. metabisulphite	 48 grs.	1 gm.
Edinol crystals	24 grs.	½ gm. 3 gms.
Potass. carbonate (cryst.)	 144 grs.	
Water	 10 ozs.	100 c.c.s.
Potass. bromide, 10 % solution	 6 drops	2 drops

The above developer, when freshly made, gives blue-black tones; when standing for some time, brown-black tones.

BIRMINGHAM PHOTOGRAPHIC CO., LTD.

"Criterion" P.O.P.

TONING BATHS.

Ammonium sulphocyanide	15 grs.	1.7 gm.
Gold chloride	1½ gr.	0·17 gm.
Water	20 ozs.	1000 c.c.s.

For Light Red Tones

	1	101	Ligiti	Trem .	10/063.	
Ammonium			anide		10 grs.	1.1 gm.
Sodium su					1 gr.	0·11 gm.
Gold chlor	ide				1 gr.	0·11 gm.
Water		e Je			20 ozs.	1000 c.c.s.

Estona (Self-Toning) Paper.

Fix, without previous washing, for 4 to 6 minutes in:

Hypo, 1½ ozs. per pint for reddish-brown tones.

Hypo, 3 ozs. per pint for warm purple tones.

Hypo, 6 ozs. per pint for deep purple tones.

The addition of 2 tablespoonfuls (1 oz.) of common table salt to each pint of hypo bath is an additional aid in securing pure whites,

"Criterion" Bromide Paper.

Amidol	 • •	75 grs.	8.5 gms.
Sodium sulphite	 	650 grs.	74 gms.
Potass. bromide	 	4 grs.	0.4 gm.
Water	 	20 ozs.	1000 c.c.s.

"Celerio" (Gaslight) Paper.

For Contrasty Effects.

Potass. metabisulphite		. 20 grs.	2.3 gms.
Metol		. 14 grs.	1.6 gm.
Hydroquinone		. 60 grs.	6.8 gms.
Sodium sulphite		. 1 oz.	50.5 gms.
Sodium carbonate		. 800 grs.	91 gms.
Potass. bromide, 10 % s	solution.		30 drops
Water		. 20 ozs.	1000 c.c.s.

For Soft Effects.

Metol				 50 grs.	5.7 gms.
Sodium	sulphite			 320 grs.	36.5 gms.
Sodium				 640 grs.	73.0 gms.
Potass. b	romide,	10 %	solution	 20 minims	1.8 c.c.
Water				 20 ozs.	1000 c.c.s.

CADETT & NEALL, LTD.

"Royal Standard" Plates.

Rapid," "Extra Rapid," "Special Extra Rapid," and "Ortho."

PYRO-SODA.

A.	Pyro		l oz.	12.5 gms.
	Sodium sulphite		8 oz.	100 gms.
	Potass. metabisulphite		50 grs.	1.5 gms.
	Potass. bromide		35 grs.	1.0 gm.
	Water (distilled or boiled)	to	80 ozs.	4000 c.c.s.
B.	Sodium carbonate		2oz.	100 gms.
	Water (distilled or boiled) .	to	20 ozs.	1000 c.c.s.

For studio work use, A, 1 part; B, 1 part; water, 2 parts.

For outdoor work use, of A and B equal quantities.

For under-exposure use more of B.

For over-exposure use more of A with addition of few drops of 10% solution of potass, bromide.

' Royal Standard" P.O.P.

Toning Bath for Cold Tones.

A. Gold chloride			15 grs.	1 gm. 54 c.c.s.
Water			 15 drs.	54 c.c.s.
B. Ammonium su	alphocya	nide	 1 oz.	45.5 gms.
Water			 22 ozs.	1000 c.c.s.

Water, 20 ozs.; B, 1 oz.; A (added gradually), 2 drachms.

Flow	Warm	Tomas

A. Gold	chloride		 	15 grs.	1 gm.
Water				15 ozs.	425 c.c.s.
B. Borax				300 grs.	23 gms.
Water		• •	 • •	30 ozs.	1000 c.c.s.

A, 1 oz.; B, 2 ozs.; water to 40 ozs.

"Cadett" Bromide Papers.

METOL-HYDROQUINONE.

		For very	y Brilliant	Prints.	
A.	Metol			100 grs.	6 gms.
	Hydroquinone				3 gms.
	Sodium sulph				20 gms.
	Water to mak	e		40 ozs. (fl.)	1000 c.c.s.
В.	Sodium carb	. (cryst.)	washing		
	soda, select	transluce	ent pieces		25 gms.
	Potass. bromie	de		60 grs.	3 gms.
	Water to make	е		40 ozs. (fl.)	1000 c.c.s.

Equal parts of A and B to make developer.

"Royal Standard" Lantern Plates.

Black Tone.

METOL DEVELOPER.

A.	Metol				 200 grs.	15 gms.
	Sodium s	ulphite	crys	st.)	 2 ozs.	60 gms.
	Potassiur	n bron	nide		 25 grs.	2 gms.
	Water				 20 ozs.	600 c.c.s.
B.	Washing	soda			 5 ozs.	150 gms.
	Water				 20 ozs.	600 c.c.s.

This developer works rather slowly, about 2½ to 3 minutes giving brilliant slides.

"CHALLENGE" WORKS.

"Challenge" P.O.P.

Toning Solutions.

A.	Ammonium	sulpl	nocyan	ide	 150 grs.	23 gms.
	Water .				 15 ozs.	1000 c.c.s.
B.	Gold chlorie	de			 15 grs.	2.3 gms.
	Water .				 15 ozs.	1000 c.c.s.

A, 2 ozs., B, added last, 2 ozs., water to make 20 ozs.

Self-Toning "Challenge" P.O.P.

Fixing Bath.

Hypo 3 ozs. 150 gms. Water 20 ozs. 1000 c c.s.

This is used for six minutes. It is made of double strength when purple tones are desired.

"Challenge" Bromide Papers.

Developer.

Amidol	 		5'7 gms.
Sodium sulphite		 650 grs.	74 gms.
Potass. bromide	 	10 grs.	1.14 gm.
Water	 • • •	 20 ozs.	1000 c.c.s.

To be used within three days of making.

"Challenge" Gaslight Paper.

Developer.

Metol		6 grs.	1.4 gm.
Sodium sulphite		$\frac{1}{2}$ oz.	50 gms.
Hydroquinone		30 grs.	6.8 gms.
Sodium carbonate (cryst.)		1 oz.	100 gms.
Potass. bromide, 10 per	cent.		
solution		30 drops	100 drops
Water		10 ozs.	1000 c.c.s.

ELLIOTT AND SONS, LTD.

Barnet Plates.

"Barnet," "Red Seal," "Ortho," and "Medium Ortho" Plates

Pyro Stock Solution, A.

	-			
Potass.	metabisulphite	 	100 grs.	6.5 gms.
Pyro	-		1 oz.	28 gms.
	1 11			
	bromide		60 grs.	3.9 gms.
Water		 	8 ozs.	225 c.c.s.

Developer.

No. 1. Solution A	 	2 ozs.	50 c.c.s.
Water	 	18 ozs.	450 c.c.s.
No. 2. Sodium carbonate		2 ozs.	100 gms.
Sodium sulphite	 	2½ ozs. 20 ozs.	112.5 gms.
Water		20 nzs	1000 c.c.s

For use, take equal parts of Nos. 1 and 2. For soft negatives or portraiture, take No. 1, 1 part; No. 2, 2 parts; water, 1 part.

"Barnet," "Rocket," "Extra Rapid," "Studio," and "Ordinary"
Plates, and Barnet Roll Film.

Α.	Pyro		 	l oz.	12 gms.
	Potass. bromide			60 grs.	2 gms.
	Nitric acid			20 drops	0.5 c.c.s.
				80 ozs.	1000 c.c.s.
B.	Sodium sulphite			9 ozs.	112 gms.
	Sodium carbonate	3	 	8 ozs.	100 gms.
	Water			80 070	1000 0 0 8

For ordinary use, equal parts of Nos. 1 and 2. For under-exposure add more of No. 2 or dilute the developer with water. For over-exposure add more of No. 1 or a few drops of 10 per cent. solution of potassium bromide.

Barnet P.O.P.

For Barnet "Ordinary" P.O.P., the A sulphocyanide solution given below is mixed with gold (16 ozs. with 2 grs. gold or 350 c.c.s. (with 0.1 gm.) to form the toning bath.

Toning Baths for Matt. P.O.P.

A. Ammonium sulphocyanide ... 80 grs. 2.3 gms.
Water ... 80 ozs. 1000 c.c.s.

B. Gold chloride ... 15 grs. 11 gm.
Water ... 15 drs. 60 c.c.s.

C. (To be made up fresh every day)

Sulphite soda 15 grs. 1 gm.
Water 15 drs. 60 c.c.s.

For use, take 16 ozs. A, 2 drachms B, and 2 drachms C.

A good rich brown tone takes about 3 minutes, but for colder tones toning should be carried further. Judge the tone by looking on the surface of the prints.

Another good bath is—
Sodium phosphate . . . 60 grs. 3 4 gms.
Gold chloride . . . 2 grs. 0 11 gm.
Water 40 ozs. 1000 c.c.s.

Keep this bath for an hour before use, and throw it away as soon as the prints are toned, as it will not keep long.

Barnet "Kiplo" (Self-Toning) Paper.

Place direct for 8 to 15 minutes in hypo, 1 oz.; water, 5 ozs.; or use a 1:20 salt bath for five minutes previous to above.

Barnet Bromide Papers.

	7	Metol D	evelop	er.	
A.	Metol			400 grs.	11 gms.
	Sodium sulphite			8 oza.	100 gms.
	Potass. bromide			oo ges.	1.5 gm.
	Water			80 ozs.	10.0 c.c.s.
B.	Potass. carbonate			8 ozs.	100 gms.
	Water			80 ozs.	1000 c.c.s.
Tak	e 3 ozs. of A and 1 oz.	of B.			

The image should appear in a few seconds, and development will be complete in about $l_{\frac{1}{2}}$ minutes. Rinse in three changes of water and fix.

Metol-Hydroquinone.

Metol	 	 200 grs.	6 gms.
Sodium sulphite	 	 6 ozs.	75 gms.
Hydroquinone	 	 150 grs.	4 gms.
Potass, carbonate	 	 2 ozs.	25 gms.
Potass. bromide	 	 50 grs.	1.5 gm.
Water	 	 80 ozs.	1000 c.c.s.

Development will be complete in from 1 to 2 minutes.

For softer prints, either of the above may be diluted with an equal bulk of water just before use.

Barnet "Oyster-Shell" (Gaslight) Paper.

Metol	 	8 grs.	1.75 gms.
Hydroquinone	 	30 grs.	7.0 gms.
Sodium sulphite	 	350 grs.	75.0 gms.
Sodium carbonate	 	300 grs.	70.0 gms.
Potass. bromide	 	3 grs.	0.7 gm.
Water	 	10 ozs.	1000 c.c.s.

The ingredients should be dissolved in the order named.

For soft prints of cold black tone, use:—Rodinal, 1 part; water, 30 parts.

Barnet Lantern Plates.

For Warm Black Tones.

A.		 	 0	18 gms.
	Sodium sulphite	 	 2 ozs.	100 gms.
	Potass. bromide	 	 30 grs.	3 gms.
	Citric acid	 	 60 grs.	7 gms.
	Water	 	 20 ozs.	1000 c.c.s.
B.	Sodium hydrate	 	 160 grs.	18 gms.
	Water		 20 ozs.	1000 c.c.s.

Take equal parts of A and B.

This produces a very pleasing warm black. Length of time in developing, about 2 minutes.

For Warm Brown Tones.

A. Pyro Soda sulphite	 ½ oz. 1 oz. 20 ozs.	12.5 gms. 50 gms. 1000 c.c.s.
B. Carbonate of ammonia	 225 grs.	26 gms.
Potassium hydrate	 190 grs.	21 gms.
Ammonium bromide	 150 grs.	17 gms.
Water	 20 ozs.	1000 c.c.s.

Take equal parts of A and B. Length of time in developing, about 2 minutes.

Or the following may be used :-

Take equal parts of hydroquinone formula and add to each curce (100 c.c.s.) 3 grs. (0.6 gm.) each of carbonate of ammonia and ammonium bromide. Length of time in developing, about 3 or 4 minutes.

For Very Warm (Reddish) Tones.

Take equal parts of hydroquinone formula and add to each ounce (100 c.c.s.) 6 grs. (1.2 gm.) each of carbonate of ammonia and ammonium bromide. Length of time in developing about 8 minutes.

Barnet (Gaslight) Lantern Plates.

For Black and Warm Black Tones.

Hydroquinone		60 grs.	6.8 gms.
Sodium sulphite		1 oz.	50 gms.
Potass. carbonate	 	2 ozs.	100 gms.
Potass. bromide	 	20 grs.	2.3 gms.
Water		20 028	1000 c c s

This solution should develop in about two minutes.

For Cold Black Tones.

Rodinal	 	 11 ozs. (fl.)	62.5 c.c.s.
Potass. bromide	 	 15 grs.	1.7 gm.
Water	 	 20 ozs.	1000 c.c.s.

For Warm Tonge

F'or	Warm To	mes.	
Eikonogen		30 grs.	3.4 gms.
Hydroquinone		10 grs.	1 2 gms.
Sodium sulphite		160 grs.	18.2 gms.
Potass. carbonate		80 grs.	9·1 gms.
Potass. bromide		15 grs.	1.7 gms.
Citric acid		20 grs.	2.3 gms.
Water		20 ozs.	1,000 c.c.s.

GEM DRY PLATE COMPANY, LTD.

"Gem" Plates.

Special for Studio Use.

T. J. T.	
A. Pyro 10	z. 10 gms.
Potass. metabisulphite 10	z. 5 gms.
Potass. bromide 20	
Water to 100	
B. Sodium carbonate 8 or	
Sodium sulphite 16 c	
Water to 100	

To develop mix equal parts of A. and B.

Potass. metabisulphite	 	40 grs.	4 gms.
Metol	 	28 grs.	0.8 gm.
Hydroquinone	 	120 grs.	12 gms.
Sodium sulphite	 	2 ozs.	96 gms.
Sodium carbonate	 	3½ ozs.	168 gms.
Water		40 022	1200 0 0 0

Add and dissolve in order named. To each ounce (28 c.c.) of developer add 2 drops of a 10 per cent. solution of potass. bromide. Dilute with an equal volume of water.

"Gem" P.O.P.

A. Ammonium sulphocyanide		30 grs.	2 gms.
Water		10 ozs.	284 c.c.s.
B. Gold chloride		2 grs.	0.13 gm.
Water		10 ozs.	284 c.c.s.
Into a portion of A pour slowly	7 an	equal portion	of B.

Combined Bath.

Sodium hyposulphite	 	5 ozs.	140 gms.
Citric acid		12 grs.	0.8 gm.
		12 grs.	0.8 gm.
Alum		120 grs.	8.0 gms.
Hot water	 	16 ozs.	500 c.c.
Stand twenty-four hours, f			
. 0 17 11 17		_	0.7

Gold chloride	 	5 grs.	0.3 gm.
Dissolved in water	 	1 oz.	30 c.c.

"Gem" Bromide and Gaslight Papers.

The metol-hydroquinone developer given above for plates is recommended, as it stands, also for "Gem" gaslight paper; for "Gem" bromide papers it is diluted with an equal quantity of water.

"Gem" Lantern Plates.

Developer for Cold Tones.

A.	Hydroquinone	 	120 grs.	8 gms.
	Potass. bromide	 	180 grs.	12 gms.
	Potass. metabisulphite	 	120 grs.	8 gms.
	Water	 	30 ozs.	900 c.c.s.
В	Caustic potash (sticks)	 	240 grs.	16 gms.
	Water		30 ozs.	900 c.c.s.

Use equal parts of A and B.

For chloride plates, dilute with water 4 to 8 times.

For Warm Tones.

C. Ammonium carbonate	 1 oz.	10 gms.
Ammonium bromide	 1 oz.	10 gms.
Water	 20 ozs.	200 c.c.s.

To obtain extra warm tones on "Gem" red lantern plates, give overexposure and develop with one part of solution A and B and one part of C, increasing C as the exposure is lengthened.

GEVAERT, LIMITED.

Gevaert P.O.P.

Toning	Baths.
--------	--------

Ammonium sulphocyanida		
Water, distilled	20 ozs.	1000 c.c.s.
Two hours before use, addition is n	nade of :-	
Gold chloride solution (15 grs.	in .	
2 ozs.)		40 c.c.s.
This formula vields fine purple blu	e tone.	

For carmine red tones, printing is done only slightly deeper than the finished print is required to be. The prints are given three fiveminute saks in water and toned in :-

Ammonium suipnocyaniae		45 grs.	5 gms.
Potass. iodide		10 grs.	1 gm.
Gold chloride solution (15 grs.	in		
2 ozs.)		21 drs.	15 c.c.s.
Water		20 ozs.	1000 c.c.s.

Toning must be continued until the deepest shadows, on holding the prints up to the light and looking through them, show the carmine tone; this will take about half an hour. Until the toning has begun the prints should be kept constantly on the move, but they can then be left to themselves, except for the movement they get as each is picked out for examination at intervals. The toning bath should be used only once, and it should be noted that the prints gain a little in dryi g. Wash in one or two changes of water, and fix in the usual hypo, bath of 2 ozs, to 20 ozs, of water.

Gevaert Collodion Paper.

GOLD TONING SOLUTION.

Sodium acetate, cryst.	 90 grs.	10 gms.
Borax, powdered	 90 grs.	10 gms.
Water	 20 ozs.	1000 c.c.s.

This solution (without gold) keeps indefinitely, and can be made up in quantity. The toning solution is made up as follows:-

Stock solution .. 18 ozs. 400 c.c.s. Gold chloride solution (15 grs. in

.. .. 1 to 1½ drs. 3 to 3.5 e.c.s. This is mixed a quarter of an hour before use, and the quantity given (18 ozs.) will tone about two dozen cabinets.

PLATINUM TONING BATH.

Potass. chloroplatinite		. 15 grs	. 1 gm.
Phosphoric acid sp. g.	r. 1·120.	. 1 (2.	9 c.o.s.
Water, distilled			

This bath should be filtered each time before use.

FIXING BATH.

Hypo... 1 oz. 50 gms. Water.. 20 ozs. 1000 c.c.s. Prints should be fixed for at least ten minutes.

SEPIA TO DARK BROWN TONES.

(1) With salt and platinum baths only, no gold bath.

Printing is done rather more deeply than the finished print should appear. Prints are washed in two or three changes of water (about five minutes in each), and then transferred to a weak salt solution (a pinch of salt in 40 czs. of water). Here they are left until they are seen to be brick-red. They are then given another couple of washes in water (each of five minutes) and transferred to the following platinum bath:—

Potass. chloroplatinite		 15 grs.	1 gm.
Phosphoric acid sp. gr.	1.120	 doz.	9 c.c.s.
Water		 42 ozs.	1200 c.c.s.

This bath is diluted with an equal or double volume of distilled water and the prints allowed to remain in it until they have reached the desired sepia or dark brown tone.

(1) With ammonia and platinum solutions only, no gold bath. A very easy and certain process.

Prints intended for a sepia tone by this method must be made lighter than for black tones. They are given a first washing in three changes of water as quickly as possible, and then placed in a bath of weak ammonia.

Ammonia	 	 	1 dr.	5 c.c.s.
Water	 	 	20 ozs.	1000 c.c.s.

In which they turn lemon yellow and appear much too light. They are given a thorough washing in six changes of water and then transferred to the platinum bath already given for black tones, but diluted with two or three times its bulk of water. They are allowed to remain until the desired tone is reached, and then washed, fixed, and finally washed as usual.

Gevaert Bromide Paper.

METOL-HYDROQUINONE DEVELOPER.

WALL OF THE	2 -10 B C +21C			
Metol		4	0 grs.	6 gins.
Hydroquinone		1	5 grs.	2 gms.
Soda sulphite, cryst.		1	OZ.	60 gms.
Potash carb nate		1	.40 grs.	20 gms.
Potass. bromide		7	0 grs.	10 gms.
Water to		2	20 ozs.	1200 c.c.s.

Dissolve the metol first in the water, and then add the other chemicals in the order given. This developer will keep good for a long time if kept well corked.

GLYCIN DEVELOPER.

Stock Mixture.

Soda, sulphite, cryst.	 4 ozs.	62 gms.
Glycin	 2½ ozs.	25 gms.
Potass. carbonate	 1 oz.	125 gms.
Water, hot, distilled	 5 ozs.	100 c.c.s.

The chemicals are dissolved in the order given, adding the potass. carbonate in small portions in order that the mixture shall not froth ever. For safety a 20-oz. measure should be used. The result is a creamy mixture, which must be vigorously shaken before use. It keeps almost indefinitely.

For	use, take :-	
	Stock colution	

Stock solution		 	d oz.	15 c.c.s.
Water		 	7 ozs.	200 c.c.s.
Datage busmi	1. 10	 		

Potass. bromide, 10 per cent.

solution 2 drops 2 drops
The print should develop up in two to three minutes, and is then

well rinsed and fixed.

Gevaert Gaslight Paper.

METOL-HYDROQUINONE	DEVELOPER.	
Metol	12 grs.	1.3 gm.
Soda sulphite	1 ozs.	75 gms.
Hydroquinone	50 grs.	6 gms.
Soda carbonate (cryst.)	3 oz.	40 gms.
Potass. bromide (10 per cent.	•	0
solution)	20-40 drops	30-60 drops
Water	20 077	1000 000

The above constituents should be dissolved in the order named. The solution keeps for a long while in well-stoppered bottles.

GLYCIN DEVELOPER.

For Warm Tones.

The time of exposure may be prolonged or curtailed in order to obtain a range of colours, and the same developing formula used for all.

Glycin developer stock mixture:-

Soda sulphite		2	d ozs.	62 gms.
Glycin				25 gms.
Potass. carbonate		5	ozs.	125 gms.
Water, distilled,	and hot	4		100 c.c.s

Dissolve the chemicals in the above order, adding the potass, carbonate last, and in small quantities as the mixture froths up. A 20-oz. measure should be used for the above quantities. The result is a mixture of creamy appearance and consistency which must be vigorously shaken before use.

	Developer.		
Stock solution		doz.	10 c.c.s.
Water		15 ozs.	200 c.c.s.
Potass. bromide (10	per cent.		
solution)		7 drops	5 drops

JOHN J. GRIFFIN & SONS, LTD.

Griffin P.O.P.

CARBONA.

Toning.

Gold chloride	4 4	2 grs.	0.23 gm.
Ammonium sulphocyanide		20 grs.	2.3 gms.
Water		20 ozs.	1000 c.c.s.

COMBINED BATH.

Distilled water	35 ozs.	2000 c.c.s.
Нуро	4½ ozs.	250 gms.
Alum	\(\frac{3}{4}\) OZ.	43 gms.
Ammonium sulphocyanide	150 grs.	20 gms.
Sodium chloride	$1\frac{1}{2}$ oz.	86 gms.

After a short time the liquid gets thick. It must then be left for eight days, and the clear liquid finally poured off. Then add to the clear solution—

Gold chloride Water	• •	• •	• •	15 grs. $3\frac{1}{2}$ ozs.	1 gm. 100 c.c.s.

PLATINUM TONING BATH.

1% potass. chloroplatinite solution	on	$5\frac{1}{2}$ drs.	20 c.c.s.
		80 grs.	5 gms.
Water up to		10 ozs.	280 c.c.s.

"SPECIAL P.O.P."

Separate Toning and Fixing.

Wash	prints	for	10	minutes,	then	place	in-
------	--------	-----	----	----------	------	-------	-----

Gold chloride	1 gr.	0.23 gm.
Ammonium sulphocyanide	10 grs.	2.3 gms.
Water	10 ozs.	1000 c.c.s.

"PROFESSIONAL" P.O.P.

Toning Bath.

Gold chloride	 1½ gr. 15 grs.	0·1 gm.
Ammonium sulphocyanide	 15 grs.	1 gm.
Water	 25 078.	700 c.c.s.

Goldona (Self-Toning) Paper.

The prints are plunged straight into the fixing bath. For warm tones, fix in 1:5 hypo for 15 minutes. For colder tones, fix in 2:5 hypo for 10 to 15 minutes.

"Snow-White" Bromide Paper.

To develop the image, first plunge the paper in clean water, place at the bottom of a clean porcelain dish, and apply evenly the following or any standard developer:—

Amidol		 70 grs.	8 gms.
Sodium sulphite		 650 grs.	74 gms.
Potassium bromide		 4 grs.	0.45 gm.
Water	٠	 20 ozs.	1000 c.c.s.

"Noctona" (Gaslight) Paper.

Developer.

Water			 20 ozs.	1000 c.c.s.
Metol	,		 15 grs.	1.7 gms.
Hydroquinone			 60 grs.	6.8 gms.
Soda sulphite		4.0	 440 grs.	50 gms.
Soda carbonate			 600 grs.	68 gms.
Potass. bromide			 7 grs.	0.8 gm.

Dissolve in the order given. Normal time of development about 30 seconds,

"Gaslyt" Lantern Plates.

Developer for Black Tones.

Water		 	8 ozs.	1000 c.c.s
Metol		 	4 grs.	1.2 gm.
Sodium sulph		 	75 grs.	20 gms.
Hydroquinone		 	16 grs.	4.6 gms.
Sodium carbon		 	280 grs.	80 gms.
Potassium bro	omide	 	8 ors.	2.3 oms

For Warm or Sepia Tones.

Solution (as for black tones)		 1 oz.
Water		 2 ozs.
Potassium bromide solution (1	O per cent.)	 10 drops

Rawlins's Oil-Pigment Paper.

Sensitizer.

Potassium	bichro	mate			l oz.	50 gms.
Water	• •	• •			20 ozs.	1000 c.c.s.

Use for about one minute.

HALIFAX PHOTOGRAPHIC CO.

"Halifax" Plates.

		OWIFF	£X.		
A.	Pyro			1 OZ.	16 gms.
	Potass, metabisulphite			½ oz.	16 gms.
	Potass. bromide			10 grs.	0.76 gm.
	Water			30 ozs.	1000 s.c.s.
D					
D,	Sodium carbonate				100 gms.
	Sodium sulphite			4 ozs.	133 gms.
	Water			30 ozs.	1000 c.c.s.
Use	equal parts of A and B,	or incr	ease	B for soft effec	et.
		TRAD	ra .		
	To	I IVAD	Pi a		
Α.	Pyro		***	doz.	12.5 gms.
	Potass. metabisulphite			30 grs.	3.4 gms.
	Water		* * *	20 ozs.	1000 c.c.s.
В.	Soda carbonate (cryst.)			2 ozs.	100 gms.
	Soda sulphite (cryst.)			2 ozs.	100 gms.
	Potass. bromide			10 grs.	1.14 gms.
	Water			20 ozs.	1000 c.c.s.
Use	equal parts of A and B.				2000 0101111
	1 1	D			
	_	Proci	EX.		
A.	Pyro			1 oz.	20 gms.
	Potass. metabisulphite			½ oz.	10 gms.
	Potass. bromide			20 grs.	0.91 gm.
	Water to make			50 oz.	1000 c.c.s.
B.	Sodium carbonate			6 ozs.	120 gms.
	Sodium sulphite			8 ozs.	160 gms.
	Water to make			50 ozs.	1000 c.c.s.
				00 0000	2000 0101111

"Lilywhite" P.O.P.

Use equal parts of A and B.

Combined Bath.

Water (pure or distilled) hot		20 ozs.	1000 c.c.s.
Нуро		5 ozs.	250 gms.
Ammonium sulphocyanide		240 grs.	27.4 gms.
Citric acid		60 grs.	6'84 gms.
Lead acetate		60 grs.	6.84 gms.
Alum		60 grs.	6.84 gms.
Gold chloride (in solution)	*,* *	3 grs.	0.34 gm.

Dissolve in the order named and use when cold. Use 1 grain of gold for 8 to 10 cabinets.

The separate toning baths (sulphocyanide, borax, and acetate) are also recommended for "Lilywhite" P.O.P.

"Lilywhite" C.C. Paper.

GOLD-PLATINUM TONING.

The well-washed parts are first toned in :-

Sodium acetate	62 grs.	4 gms.
Gold chloride, 1 per cent. solution	62 grs.	4 gms. 9 c.c.s.
Water	2½ drs. 14 ozs.	400 c.c.s.

After an intermediate wash of about 3 minutes, tone in-

OT OUT ATTA	0122001000	1110035 02	000000	AMERICA OF SOIL	O ALL
	chloropla			15 grs.	1 gm.
Phosph	oric acid	sp. gr. 1	12)	2½ drs.	9 c.c.s.
Water				40 ozs.	1140 c.c.s.

"Lilywhite" Self-Toning P.O.P.

Fixing bath for brown to purple tones-

Нуро	 	 	4 ozs.	200 gms.
Water	 	 	20 ozs.	1000 c.c.s.

For warmer tones this is used half-strength.

For colder tones five minutes' immersion in 10 per cent. salt bath is given prior to fixing.

"Lilywhite" Bromide Paper.

Metol	 	 50 grs.	5.7 gms.
Hydroquinone	 	 15 grs.	1.7 gm.
Soda sulphite	 	 500 grs.	57 gms.
Potass. bromide	 	 10 grs.	1·1 gm.
Potass. carbonate		 100 grs.	11.4 gms.
Water	 	 20 ozs.	1000 c.c.s.

"Lilywhite" Gaslight Paper.

Developer.

Water (boiled or distilled) cold	20	ozs.	1000 c.c.s.
Metol	15		1.71 gm.
Sodium sulphite (cryst.)	540	grs.	61.6 gms.
Hydroquinone	60	grs.	6.84 gms.
Sodium carbonate	108	0 grs.	123'1 gms.
Potass, bromide	3 ø	re	0:34 gm

Dissolve in order named and keep well corked. A few drops of 10 per cent. solution potass. bromide should be added if increased contrast is desired. If softer results are wanted, increase the exposure and dilute the developer with equal bulk of water.

ILFORD, LTD.

Ilford Plates.

(" Ordinary," "Zenith," "Monarch," "Chromatic," etc.)

PYRO-SODA DEVELOPER.

Stock Solutions.

A. Water	 	 53 ozs.	150 c.c.s.
Nitric acid	 	 20 drops	20 drops (1 c.c.)
Pyrogallic acid	 	 loz.	28 gms.

This solution will keep good for several weeks.

()r--

В.	Water		5½ ozs.	150 c.c.s.
	Potass. metabisulphite		70 grs.	5 gms.
	Pyrogallic acid	0.0	1 oz.	28 gms.

This solution will keep good for several months.

Working Solutions.

No. 1. Stock solution of pyro, A or B 1 to 2 or Water to make up to 20 ozs.	
No. 2. Sodium carbonate, crystals (not bicarbonate) (avoirdupois) . 2 ozs. Sodium sulphite (avoirdupois) . 2 ozs. Potassium bromide 20 grs. Water to make up to 20 ozs.	

For normal exposure take equal quantities of Nos. 1 and 2.

METOL-HYDROQUINONE.

A. Metol	• •	60 grs. 90 grs. 90 grs.	3.5 gms. 5 gms. 5 gms.
Water up to		20 ozs.	500 c.c.s.
D Cadium carbonata (arrestala)		0 000	60 0000

Sodium carbonate (crystals)	 2 ozs.	50 gms.
Sodium sulphite (crystals)	 2 ozs.	50 gms.
Potass bromide	 20 grs.	1 gm.
Water up to	 20 ozs.	500 c.c.s.

METOL-PYRO DEVELOPER.

This developer is fully as energetic as metol-hydroquinone. In dealing with unknown exposures it is best to start with equal parts of A and C, and add B and more of C if necessary afterwards.

A.	Stock solution of pyro	 	2 ozs.	50 c.c.s.
	Water up to	 	20 ozs.	500 c.c.s.
В.	Metol	 	90 grs.	5 gms.
	Potass. metabisulphite		20 grs.	1 gm.
	Potass. bromide	 	45 grs.	2.5 gms.
	Water up to		20 ozs.	500 c.c.s.

C. Sodium carbonate (crystals) (not bicarbonate) 2 ozs. 50 gms. Sodium sulphite (crystals) ... 2 ozs. 50 gms.

Sodium sulphite (orystals) ... 2 ozs. 50 gms.
Potass. bromide 20 grs. 1·1 gm.
Water up to 20 ozs. 500 c.c.s.

Normal Developer.—A, 1 part; B, 1 part; C, 2 parts.

Ilford "Process" Plates.

Development of Line Negatives.

A.	Metol	 	30 grs.	2.3 gms.
	Hydroquinone	 	150 grs.	11.4 gms.
	Sodium sulphite	 	31 ozs.	108 gms.
	Water	 	30 ozs.	1000 c.c.s.
B	Potass carbonata		6.029	200 cms

B. Potass, carbonate . . . 6 ozs. 200 gms. Potass, bromide . . . 90 grs. 6.8 gms. Water 30 ozs. 1000 c.c.s.

Use equal parts of A and B, develop for about one minute, then immerse in a weak solution of sodium citrate (or add a little to the developer), and complete development. Great density is thus obtained.

The negatives should be fixed in an acid-alum-hypo bath, and can then be dried quickly in moderate warmth.

Development of Screen Negatives.

A.	Metol	 	 40 grs.	4.6 gms.
	Hydroquinone	 	 50 grs.	5.7 gms.
	Potass. bromide	 	 30 grs.	3.4 gms.
	Soda sulphite	 	 80 grs.	9·1 gms.
	Water	 	 20 ozs.	1000 c.c.s.
B.	Caustic potash	 	 100 grs.	11.4 gms.
	Water	 	 20 028.	1000 c.c.s.

Use equal quantities of A and B, fix in hypo (8 ozs. to the pint), "out" with Farmer's reducer, clear with

 Sulphuric acid
 ...
 ...
 2 drs.
 25 c.c.s.

 Water
 ...
 ...
 10 ozs.
 1000 c.c.s.

and intensify by Monckhoven method.

Dye Bath for Three-Colour Work.

Stock Solution A.

	Pinaverdol	 	1 gm.
	Warm absolute alcohol	 	1000 c.c.s.
The	bathing solution is composed of :-		
	Solution A		4 parts

in which plates are immersed for three minutes.

Ilford P.O.P.

Hardening Bath.

Alum	 	 	1; oz.	45 gms.
Common		 	1 oz.	30 gms.
Water	 	 	20 ozs.	600 c.c.s.
-1.1-1	 t	 . P*	10	

in which prints are kept moving for 5 or 10 minutes.

Toning Bath.

No. 1. Ammonium sulp	hocyanide	100 g	
Water		10 o	zs. 300 c.c.s.
No. 2. Sodium sulphite		10 g	rs. 0 65 gm.
Water		10 02	zs. 300 c.c.s.

This solution must be made up only on the day of using; any left must be thrown away.

No. 3. Gold chloride 15 grs. 1 gm. Water 15 ozs. 450 c.c.s.

For the usual toning bath, take 2 ozs. each of Nos. 1 and 3, and make up to 20 ozs. with water.

For warm tones and Special P.O.P. add $1\frac{1}{4}$ to 2 ozs. of No. 2 to the above bath just before toning, and withdraw prints according to tone desired.

Kalona (Self-Toning) Paper.

The prints, without previous washing, are slipped rapidly one by one face upwards into the following solution:—

where they must be constantly turned over for five minutes. The prints should next be washed for ten minutes in running water or repeated changes, and fixed for ten minutes in a solution of—

Hypo 3 ozs. 75 gms. Water 20 ozs. 500 c.c.s.

They are then finally washed for two hours in the same way as Ilford P.O.P.

In tropical climates the following may be used instead of the ordinary formula:—

 Ammonium sulphocyanide
 ... 20 grs.
 2·3 gms.

 Chrome alum
 20 grs.
 2·3 gms.

 Water
 20 ozs.
 1000 c.c.s.

The colour of the prints is not affected.

The alum and sulphocyanide solution may be omitted and the prints put into a solution of—

Common salt 1 oz. 50 gms. Water 20 ozs. 1000 c.c.s.

for five minutes and then fixed, but the resulting tone is warmer than that obtained by the use of the sulphocyanide. It is, however, permanent. Prints treated in this way are not so suitable for enamelling.

Ilford Bromide Paper and Opals.

Metol-Hydroquinone Developer.

No. 1. Metol			50 grs.	4 gms.
Hydroquinone .			25 grs.	2 gms.
Sodium sulphite .			1 oz.	35 gm 3.
Water up to			20 ozs.	700 cc.s.
No. 2. Sodium carbonate	(crystals)		1 oz.	35 gms.
Potass. bromide .			30 grs.	2.4 gms.
Water up to .			20 ozs.	700 c.c.s.
Take equal quantities of	of No. 1 and	No.	2.	

Certinal Developer.

Certinal	 	 	16 minims	1 part
Water	 	 	1 oz.	30 parts

Ilford Gaslight Papers.

Developer.

Metol	5 grs.	0.3 gm.
Sodium sulphite	½ oz.	15 gms.
Hydroquinone	20 grs.	1.3 gm.
Sodium carbonate (crystals)	1 oz.	15 gms.
10 per cent. solution of pot	ass.	
bromide	10 minim	as 06 c.c.s.
Water	10 ozs.	300 ccs

This developer, as also the following Certinal developer, is also used for the "Ilford" Gaslight Lantern Plates:—

	 -0	 		
Certinal	 	 	32 minims	1 part
Water	 	 	1 07.	15 parts

liford "Platona" (Platinum) Paper.

Developing Formula.—Stock Solution.

Potass. oxalate	 2 ozs.	72 gms.
Potass. phosphate	 1 oz.	18 gms.
Water	14 028	500 000

This solution is better if slightly acid; if it is not so, 60 grs. (4 gms.) exalic acid should be added. If potassium phosphate is unobtainable, the sedium phosphate may be substituted, but the former is preferable. Dissolve the salts in hot water, and allow to cool. This solution will keep indefinitely.

For use, take 1 part stock solution and 1 part water.

Fixing.

	loric ac	id (pure)	1 oz.	20 c.c.s.
Water			 80 ozs.	1600 c.c.s.

Immerse prints for about five minutes each in three consecutive baths, and then give them a final washing in water for fifteen minutes.

Ilford Lantern Plates.

"SPECIAL"-FOR BLACK TONES.

Metol-Hudroquinone Developer.

1.	Metol			 50 grs.	5.6 gms.
	Hydroquinone			 25 grs.	2.8 gms.
	Sodium sulphite			 1 oz.	50 gms.
	Water up to			20 ozs.	1000 c.c.s.
2.	Sodium carbonat			 1 oz.	50 gms.
	Potass. bromide		٠	 30 grs.	3.4 gms.
	Water up to			 20 ozs.	1000 c.c.s.
Eq	ual parts of Nos. 1	and	2.		

Hydroquinone Developer.

	4.	i gui og	000100100	Dec	etoper.	
1.					160 grs.	18.2 gms.
	Sodium sulphite				2 ozs.	100 gms.
	Water up to				20 ozs.	1000 c.c.s.
2.	Sodium hydrate				80 grs.	9·1 gms.
	Sodium sulphite				30 grs.	3.4 gms.
	Water up to				20 ozs.	1000 c.c.s.
BT -	1 1 mant . Mr. O	1	4 4 -	0	in a subsection	

No. 1, 1 part; No. 2, 1 part; water, 2 parts.

Certinal Developer.

Certinal	 	 	16 minims	1 part
Water	 	 	1 oz.	30 parts

"AIPHA" PLATES-FOR WARM TONES.

The only suitable developer is :-

A.	Hydroquinone	 	 80 grs.	9·1 gms.
	Sodium sulphite	 	 1 oz.	50 gms.
	Water to		 20 ozs.	1000 c.c.s.
В.	Sodium hydrate		30 grs.	3.4 gms.
	Potass. bromide		 15 grs.	1.7 gms.
	Water	 	 20 ozs.	1000 c.c.s.

A, 1 oz.; B, 1 oz.

The hydroquinone solution should not be used after it has become yellow, as it loses its developing power.

GASLIGHT.

For developers, see under Ilford Gaslight Papers above.

TONING AND FIXING BATH.

The plates must be thoroughly washed after development and are fixed and toned in one operation by means of a combined bath. The formula is:—

Нуро	$2\frac{1}{2}$ ozs.	250 gms.
Ammonium sulphocyanide	1 oz.	25 gms.
Gold chloride	4 grs.	0.9 gm.
Water	10 ozs.	1000 c.c.s.

The three salts should be dissolved in water and the gold chloride added last of all. A convenient plan is to dissolve the hypo and sulphocyanide in 6 oz. of water and then add 4 oz. of the stock solution

of gold chloride (15 grains in 15 oz.) used to make up the toning bath for P.O.P. The bath should be made up a day or two before it is used.

When placed in this bath the plates fix rapidly and the image has a red or red brown colour if the exposure has been sufficient, but this colour gradually changes to brown, photographic purple, purple black, black, and finally blue, as the action of the bath is allowed to continue. The plate should be removed and well rinsed with water when its colour is somewhat warmer than that desired in the finished slide.

Of course if a red-toned slide is desired the plates should be simply fixed in plain hypo and if necessary modified by a short immersion in the toning bath. From 35 to 60 minutes toning is required in order to obtain a blue colour; photographic purple is obtained in about 15

minutes and purple black in about twenty-five.

THOS. ILLINGWORTH & CO., Ltd.

"Zigo" Self-Toning Papers.

For brown or purple tones place prints direct in

Нуро	 	 4 oz. (4 tablespoonfuls)	200 gms.
Water	 	 20 oz. (1 pint)	1000 c.c.s.

For red tones, use half the above strength.

For sepia tones, immerse print direct in 10 % salt solution for five minutes, and then, without washing, transfer to hypo bath.

Illingworth Bromide Paper.

AMIDOL DEVELOPER.

Amidol	 	 50 grs.	5.7 gms.
Sodium sulphite		600 grs.	70 gms.
Potass. bromide	 	 10 grs.	1.2 gm.
Water	 	 20 oz.	1000 c.c.s.

To be used within three days of mixing.

"Zigas" Gaslight Paper,

DEVELOPER.

Metol	 7 grs.	1.6 gm.
Hydroquinone	 30 grs.	6.8 gms.
Sodium sulphite	 220 grs.	50 gms.
Sodium carbonate	 400 grs.	91 gms.
10% bromide of potassium	 30 to 40 drops	100 to 120 drops
Water	 10 ozs.	1000 c.c.s.

The prints are fixed in an acid bath.

IMPERIAL DRY PLATE CO., LTD.

Imperial Plates.

("Special Rapid," "Flashlight," "Orthochrome," and "N.F.")
"STANDARD" DEVELOPER.

No. 1.	Metol		45 grs.	5 gms.
	Potass. metabisulphite		120 grs.	14 gms.
	Pyrogallic acid		55 grs.	6 gms.
	Potass. bromide		-20 grs.	2 gms.
	Water (boiled or distilled)	to	20 ozs.	1000 c.c.s.

No. 2. Sodium carbonate (washing soda) 4 ozs. 200 gms. Water (boiled or distilled) to . . 20 ozs. 1000 c.c.s.

For use, take equal parts of No. 1 and No. 2.

"Universal" Developer.

No. 1.	Metol	 40 grs.	5 gms.
	Sodium sulphite	 120 grs.	14 gms.
	Hydroquinone	 50 grs.	6 gms.
	Potass. bromide	 15 grs.	2 gms.
	Water (boiled or distilled) to	 20 ozs.	1000 c.c.s.
No. 2.	Caustic potash	 180 grs.	21 gms.
	Water (boiled or distilled) to	 20 ozs.	1000 c.c.s.

For use, take equal parts of No. 1 and No. 2.

In making up No. 1 solution dissolve the metol in 12 ozs. of water at 95°, and the sulphite in 4 ozs. at 95°; when both are completely dissolved mix and add the hydroquinone, and then the bromide, and make up to 20 ozs. For No. 2 begin with 16 ozs. of water at 95°.

PYRO-SODA DEVELOPER.

Stock Solution.

Potass. metabisulphite	50 grs.	10 gms.
Pyrogallic acid	1 oz.	83 gms.
Potass. bromide	60 grs.	13 gms.
Water (boiled or distilled) to	12 ozs.	1000 c.c.s.
No. 1. Stock solution	3 ozs.	150 c.c.s.
Water (boiled or distilled)	20 ozs.	1000 c.c.s.
No. 2. Sodium sulphite	2 ozs.	100 gms.
Sodium carbonate (washing soda)	2 ozs.	100 gms.
Water (boiled or distilled) to	20 ozs.	1000 c.c.s.
For use, take equal parts of No. 1 and	No. 2.	

HYDROQUINONE DEVELOPER.

No. 1. Potass. metabisulphite	10 grs.	1 gm.
Hydroquiaone	150 grs.	16 gms.
Potass, bromide	50 grs.	6 gms.
Water (boiled or distilled) to	20 ozs.	1000 c.c.s.

No. 2	. Sodium sulphite		2 ozs.	100 gms.
	Caustic soda		100 grs.	11 gms.
	Water (boiled or distilled) to	20 ozs.	1000 c.c.s.

For use, take equal parts of No. 1 and No. 2.

After using this developer, always rinse the negative well before transferring to the fixing bath.

SINGLE-SOLUTION DEVELOPER.

Metol			 50 grs.	5.5 gms.
			 40 grs.	4.5 gms.
Sodium sulphite			 500 grs.	57 gms.
Potass. bromide			 25 grs.	3 gms.
Sodium carbonate			 500 grs.	57 gms.
Water (boiled or	disti	illed) to	 20 028.	1000 ccs.

Imperial P.O.P.

SULPHOCYANIDE TONING BATH. Stanta Cald Salation

Stock Gold Solution.	
Chloride of gold 15 grs.	18 gms.
Water (distilled or boiled) to 15 drs.	1000 c.c.s.
No. 1. Ammonium sulphocyanide 60 grs.	6.8 gms.
Water (boiled or distilled) to 20 ozs.	1000 c.c.s.
No. 2. Stock gold solution 5 drs.	31 c.c.s.
	1000 c.c.s.
For use, take equal quantities of No. 1 and No. 2.	
Add solution No. 2 slowly to solution No. 1 stirring	all the time

Imperial Self-Toning P.O.P.

Print exactly as P.O.P. and without any washing, immerse prints in-

	Ammonium sulphocyanide		20 grs.	2.3 gms.
	Powdered alum		$1\frac{1}{2}$ oz.	75 gms.
	Water		20 ozs.	. 1000 c.c.s.
he	temperature of this bath shou	ıld n	ot be more	than about 60°.

"Imperial" Bromide and Gaslight Papers

	mperia	DIO	minuc	CLIRA	dasiight	apers.
Α.					50 grs.	5.7 gms.
	Hydroquinone				40 grs.	4.6 gms.
	Sodium sulphite				500 grs.	57 gms.
	Water to make		* 8		20 ozs.	1000 c.c.s.
В.	Potass bromide				25 grs.	2.8 gms.
	Sodium carbonal				500 grs.	57 gms.
	Water to make				20 ozs.	1000 c.c.s.
Equ	al quantities of A	and	B.			

Imperial "Special" Lantern Plates are developed with the hydroquinone formula given above for negative plates.

Imperial "Gaslight" Plates are developed in a single solution made

by dissolving all the chemicals of the bromide paper developer given above in 20 ozs. (or 1000 c.c.s.) of water.

KENTMERE, LTD. "Kentmere" P.O P.

Phosphate Toning Bath.

Gold chloride	 	2	grs.	0·11 gm.
Soda phosphate	 	6	0 grs.	3.42 gms.
Water			0 ozs.	500 c.c.s.

or enough to cover prints.

This bath is recommended for toning cards or prints in quantities, 2 grains of gold toning about 100 post-cards. The more water added the slower the toning. Use enough water to allow of cards being moved easily and quickly.

"Kentmere" Self-Toning P.O.P.

Place into one of the following fixing baths with or without previous washing. Do not let fixing bath be too cold.

For	Red	Brown	Tones.	For	Purple	Tones.
Нуро		***	4 ozs.	Нуро		6 ozs.
Water			1 pint.	Water		1 pint.

Remove from bath immediately desired tone is reached, which should not be less than five minutes or more than eight.

"Kentmere" Bromide and Gaslight Papers,

Developers.

	4		
	BROMIDE.	GA	SLIGHT.
Metol	10 grs. 1.14 gm.	14 grs.	1.60 gm.
Hydroquinone	30 grs. 3.42 gms.	60 grs.	6.84 gms.
Water to	20 ozs. 1000 c.c.s.	' 20 ozs	1000 c.c.s.
Dissolve and	add—		
Soda sulphite .	3 oz. 37'5 gms.	1 oz.	50 gms.
Soda carbonate.	\(\frac{3}{4}\) oz. 37.5 gms.	1 oz.	50 gms.
Potass. bromide	10 grs. 1.14 gm.	6 grs.	0.68 gm.

KODAK, LTD.

Kodak Film.

Pyro Developer.

Atso for From-pac	ch an	a noaoras.	
A. Pyrogallic acid		1 oz.	30 gms.
Sulphuric acid		20 minims	1 c.c.
Water		28 ozs.	900 c.c.s.
B. Sodium sulphite		6 ozs.	180 gms.
Sodium carbonate crystal		6 ozs.	120 gms.
Water		28 ozs.	900 c.c.s.
4 1 D 1			

A, 1 oz.; B, 1 oz.; water, 8 ozs.

For Kodak developing machine, Brownie developing box (6 minute development) or Kodak film tank (10 minute development) take A, 1 oz.; B, 1 oz.; water, 10 ozs.

Kodoid Plates and Premo Film Pack.

A.	Metol			60 grs.	7 gms.
	Hydroquinone		 	30 grs.	3.5 gms.
	Sodium sulphite		 	1 ozs.	75 gms.
	Water		 	20 ozs.	1000 c.c.s.
B.	Sodium carbonat	ie	 	1 oz.	50 gms.
	Water		 	20 ozs.	1000 c.c.s.

A, 1 oz.; B, 1 oz.; water, 2 ozs.

Add 1 or 2 drops 10 per cent, solution potassium bromide to each oz. of developer.

Eastman Plates.

Developer.

			32 ozs.	1000 c.c.s.
Potas	sium metabisulp	hite	60 grs.	4 gms.
Potas	s. bromide		60 grs.	4 gms.
Pyro			1 oz.	30 gms.
B. Water	r		32 ozs.	1000 c.c.s.
Sodiu	m sulphite		8 ozs.	250 gms.
C. Water	r		32 ozs.	1000 c.c.s.
Sodiu	m carbonate		8 ozs.	250 gms.
A. 2 parts	· B. 2 narta · C	2 narta · wa	ter 3 parts	

Seed Plates.

		Developer.		
A.	Pyro		1 oz.	60 gms.
	Soda sulphite crystal		4 ozs.	240 gms.
	Sulphuric acid		5 drops.	none.
	Water		16 ozs.	1000 c.c.s.
B.	Soda carbonate crysta	ıl	4 ozs.	240 gms.
	Water		16 ozs.	1000 c.c.s.
For	use, A. 1 oz.: B. 1 oz	.: water. 8	ozs.	

Kodak Solio P.O.P.

Toning Bath Stock Solution.

Gold chloride	 15 grs. (1 tube)	1 gm.
Ammonium sulphocyanide	 150 grs.	10 gms.
Water to	 30 ozs.	1000 c.c.s.

The sulphocyanide should be dissolved first and the gold added after-

wards. Each ounce contains } gr. of chloride of gold.

To impart to a 1s. packet of paper a cold purple-black tone take 6 ozs. of the stock solution and dilute with water to measure, say, 30 ozs. Treat all the prints at the same time, and allow them to remain in the bath for eight minutes, keeping them in motion as usual

in toning.

For a purple-brown colour a packet of paper requires 3 ozs. of stock solution, or for a brown colour 1½ oz. of stock solution, whilst 1 oz. of

stock solution will give a red tone.

The amount of water to be added to the stock solution is in all

cases just as much as is considered necessary for conveniently handling the prints.

Wash the batch of the prints well for 10 minutes in running water (or in three changes of water). Transfer as rapidly as possible the whole of them, one by one, to the toning bath.

Tone for 8 or 10 minutes, moving the prints all the time, and rinse well before fixing.

COMBINED TONING AND FIXING BATH.

A.	Нуро	 6 ozs.	200 gms.
	Ammonium sulphocyanide	 48 grs.	4 gms.
	Water	 32 ozs.	1000 c.c.s.
В.	Gold chloride	 15 grs. (1 tul	oe) 1 gm.
	Lead acetate	 150 grs.	10 gms.
	Water	 16 028	500 c.c.s.

Take 7 parts of A to 1 part of B. Print decidedly darker than for ordinary bath. Wash thoroughly and tone in this bath.

Platinum Toning for Matt " Solio."

Potassium chloroplatinite	5 grs.	1 gm.
Citric acid	 40 grs.	8 gms.
Sodium chloride (salt)	 40 grs.	8 gms.
Water	 20 ozs.	1000 c.c.s.

This bath keeps well for a month.

Wash the prints from 5 to 10 minutes, and then immerse in the

above bath, examining the prints by transmitted light.

Tone to a dark brown or chocolate colour (not black), rinse slightly, and immerse the prints in the following bath to stop the toning action:—

	odium ce	arbonate	(wash	ing sod	a)	½ oz.	15 gms.	
V	Vater					20 ozs.	600 c.c.s.	
Rinse	and trai	asfer to t	he fol	lowing	fixi	ng bath:		
S	odium h	yposulph	ite				150 gms.	
70	Tatan					20 000	1000 0 0 0	

Wash thoroughly in running water or in frequent changes for one bour.

DEVELOPING "SOLIO."

Develop with the following developer until the prints look similar to printed-out prints, but rather more brown in colour; this should take 5 or 6 minutes.

2441440000			
Hydroquinone	 	 26 grs.	2 gms.
Citric acid	 	 60 grs.	5 gms.
Sodium acetate	 	 $1\frac{1}{2}$ oz.	50 gms.
Water	 	 30 ozs.	1000 c.c.s.

Wash for about 15 minutes. The prints will continue to develop very slightly, and for this reason care should be taken not to develop them too dark. Then tone in the sulphocyanide or combined toning and fixing bath in the usual way

KODAK "SOLIO" No. 2.

The sulphocyanide bath for cold tones is that already given for ordinary " Solio."

For warm tones the following stock solution is prepared:-

Gold chloride 15 grs. 1 gm. Water 30 ozs. 1000 c.c.s.

Take 1 part of the stock solution to 10 parts of water. Neutralise exactly with a saturated solution of borax, add one drop at a time, stir and test with litmus paper, repeating this operation until the bath does not alter the colour of blue or red litmus paper. This borax toning bath is ready for use at once, but will not keep.

PLATINUM TONING FOR MATT SOLIO NO. 2.

To obtain rich sepia tones make up the following stock solutions :--

Potassium chloroplatinite .. 15 grs. Citric acid 2 drs. 1 gm. 8 gms. Sodium chloride (common salt)... 2 drs. 8 gms. Water 30 ozs. 1000 c. 1000 c.c.s.

For use, take 1 part of the stock solution and add 20 parts of water. Tone until the high-lights are clear, which takes about 5 minutes, and then immerse the prints in the following bath to stop further toning:-

Sodium carbonate (washing soda

15 gms. 600 c.c.s.

Again rinse and fix, etc., as already described.

Kodak Collodio-Chloride Papers.

Matt.

When the prints are sufficiently washed and ready to tone, they are first placed in a plain gold bath, made alkaline with borax, enough to turn red litmus paper blue in one minute.

0·16 gm. Gold chloride 2½ grs. .. 60 ozs. 1700 c.c.s.

Add sufficient of a saturated solution of borax to make bath very slightly alkaline (about 25 to 30 drops). The bath should be made up

one to two hours before use.

Tone in this bath to chocolate brown in the deepest shadows by transmitted light. Add gold enough to keep the speed of the bath 6 to 8 minutes. If the prints show bleaching in the half-tones before the shadows are toned far enough, add more borax. The alkali acts as a restrainer on the half-tones. The amount to use is the amount necessary to hold the half-tones from bleaching while the shadows tone. When the prints are toned, place in clear water; and when all

are toned, wash in three changes of water and tone in platinum hath.

KODAK GLOSSY C.C. PAPER.

Print considerably darker than desired when finished and after washing tone in the following bath:—Water 60 ozs., kodak gold solution 2 drachms (or, if dry chloride of gold is used, 2 grains), and drachm of dry acetate of soda. Add a few drops of saturated solution of borax, enough to make the bath slightly alkaline. Allow to stand 2 or 3 hours before using.

For Dark Tones.

Water	 32 ozs.	900 c.c.s.
Ammonium sulphocyanide	 doz.	14 gms.
Gold chloride	 2 grs.	0·13 gm.

ARISTO-PLATINO C.C. PAPERS.

Gold Toning Baths.

Salt	 	 30 grs.	0.68 gm.
Gold chloride	 	 4 grs.	0·1 gm.
Water	 	 100 ozs.	1000 c.c.s.

Add saturated borax solution enough to turn red litmus paper blue in half a minute.

ARISTO JUNIOR.

Salt		20	grs.	0.9 gm.
Sodium acetate	(saturated	solu-		_
tion)		1	oz.	8 c.c.s
Gold chloride		2	ors.	0.07 gm.
Water				1000 c.c.s.
TT GOOD		00	OZIO.	TOOO 0.0.D.

Add saturated solution of soda carbonate or borax, enough to turn red litmus paper blue in 1 to 2 minutes. Bath is made up 4 to 5 hours before use and should tone in 6 to 8 minutes.

For dark tones on "Aristo Junior," the following bath is used :-

Ammonium sulphocyanide	3 oz.	14 gms.
Gold chloride	2 grs.	0·13 gm.
Water	32 ozs.	900 c.c.s.

Kodak Self-Toning Papers.

"SOLIO" (GELATINE) P.O.P.

Put the prints, without previous washing, into the following bath, and keep them moving for 3 to 5 minutes.

Ammonium sulphocyanide .. 20 grs. Water 20 ozs. 2 gms. 1000 c.c.s.

Wash for 5 minutes in running water, or several changes, and fix in-

.. 3 ozs. 150 gms. Hypo .. 20 ozs. 1000 c.c.s. Water

for 10 minutes. Then wash in running water for one hour, or in 15 to 16 changes.

The following alternative baths will give good warm tones on both grades of paper, but are specially recommended for matt. Put the prints, without previous washing, into the following bath:—

Salt 1 oz. 50 gms. Water 20 ozs. 1000 c.c.s.

for 5 minutes, and then place in the above fixing bath.

COLLODION, GLOSSY AND MATT.

For cold, purple brown tones, immerse without previous washing directly into hypo, $2\frac{1}{2}$ ozs.; water, 20 ozs., for 10 minutes.

For warm brown tones, wash in three changes of cold water, and

transfer for 10 minutes to fixing bath.

For rich purple black tones, put the print directly into salt, 60 grs.; water, 20 ozs., for three minutes, and then transfer to the fixing bath for 10 minutes.

"ARISTO" COLLODION.

For Warm Tones.

Wash in two changes and fix for 15 minutes in 1:8 hypo, made slightly alkaline with ammonia; transfer for 10 minutes to 1:20 salt bath and wash.

For Cold Tones.

Treat for 5 minutes in 1:60 salt bath, take out into clean water, fix for 15 minutes in 1:8 hypo bath, and transfer (for 10 minutes) to 1:20 salt bath, finally washing as usual.

Kodak Bromide Papers.

"Permanent," "Platino-Matte," "Royal," "White Royal," "Nikko," and "Velvet."

Metol-Hydroquinone Developer.

Metol		8 grs.	0.9 gm.
Hydroquinone		30 grs.	3.5 gms.
Sodium sulphite		3 oz.	38 gms.
Sodium carbonate			38 gms.
10% solution potassium	bromide	20 minims	1 c.c.
Water		20 ozs.	1000 c.c.s.

Amidol Developer,

Amidol		60 grs.	1.8 gm.
Sodium sulphite		1 oz.	50 gms.
10% solution potassium	bromide	20 drops	1.5 c.c.s.
Water		20 ozs.	1000 c.c.s.

HYPO-ALUM SEPIA TONING.

Нуро	 	 10 ozs.	280 gms.
Alum	 	 1 oz.	28 gms.
Boiling water	 	 70 ozs.	2000 0.08

Dissolve the hypo in the water, and then add the alum slowly. When all is dissolved the solution should be milk white. This solution should not be filtered, and it works better as it becomes older; it

may be strengthened from time to time with a little fresh solution. Never throw the bath away entirely, but replenish it in the manner stated. The best results are obtained on prints developed by the above amidol formula, and by keeping the bath hot, or as warm as the emulsion will stand, say 100 to 120 degrees F. In this bath prints will tone in 30 to 40 minutes.

When toned, the prints should be placed in a tepid solution of-

Water 70 ozs. 2000 c.c.s. Alum 2 ozs. 60 gms.

then washed thoroughly.

Kodak Gaslight Papers.

" Декко."

Developer.

Hydroquinone	 30 grs.	3.5 gms.
Metol	 7 grs.	0.8 gm.
Sodium sulphite	 220 grs.	25 gms.
Sodium carbonate	 400 grs.	45 gms.
Potassium bromide (10% sol.)	 10 drops	16 drops
Water up to	 20 028	1000 c c g

A fixing bath of the "acid" type (hypo, sulphite, acetic acid, and alum) should be used.

"VELOX."

Dissolve in the order given :-

Water, up to

Metol	7 grs.	0.8 gm.
Hydroquinone	30 grs.	3.5 gms.
Sodium sulphite (cryst.)	220 grs.	25 gms.
Sodium carbonate (cryst.)	400 grs.	45 gms.
10% sol. of potass. bromide	10 to 20 drops	16 to 30 drops

.. 10 ozs.

500 c.c.s.

For Vigorous Grade, use above full strength; for Soft (or Special Grade, dilute with equal bulk of water.

Warm Tone Developer.

(For Vigorous Velox only.) .

Expose for six times the normal, and develop in the following using 1 part of A added to 2 parts of B. Development takes 6 to 10 minutes for sepia brown colour.

A. Pure p	rotosulpha	ate of	iron	 	1½ ozs. 10 ozs.
Water					
Sulphu	ric acid			 	3 minims.

The iron sulphate crystals must first be thoroughly dissolved. The solution will be rather turbid, and the sulphuric acid ought to clear

it in a few minutes. If it does not, the sulphate crystals were probably oxidised considerably, and one or two additional minims of sulphuric acid may be used till the solution becomes of a clear pale apple-green tint.

B. Citrate of soda	 	 	5 ozs.
Citric acid	 . 1	 	4 ozs.
Water	 	 	20 ozs.

When ready to develop, add 1 part of A to 2 of B.

Kodak Platinum Paper.

Developer for Warm Black Tones.

Neutral	potassiu	m oxe	late	 4 ozs.	200 gms.
Water				 20 ozs.	1000 c.c.s.

For Bluer Tones.

Neutral potassium oxalate	2 ozs.	100 gms.
Potassium phosphate	1 oz.	50 gms.
Water	20 ozs.	1000 c.c.s.

Any potassium phosphate will do for this developer, but the one which gives by far the best results, and should be used if obtainable, is the mono-potassium di-hydric ortho-phosphate (KH₂PO₄).

The temperature of the developer should be from 60° to 65° F. Clearing bath:—Hydrochloric acid, \(\frac{1}{2} \) oz.; water, 20 ozs.

"Eastman" Lantern Plates.

Gaslight-For Warm Tones.

A.	Water Hydroquinone Sodium sulphite (crystals)	 16 ozs. 120 grs. 1 oz.	600 c.c.s. 10 gms. 30 gms.
В.	Water *Caustic soda Potassium bromide	 16 ozs. 60 grs. 60 grs.	600 c.c.s. 5 gms. 5 gms.
C.	Water *Ammonium carbonate	 16 ozs. 120 grs.	600 c.c.s. 10 gms.

* The caustic soda should be fresh and dry. The ammonium carbonate should be in clear lumps. If covered with white, powdery bicarbonate from exposure to the atmosphere, this should be scraped off before weighing.

For brown tones: A, 1 oz.; B, 1 oz.; and C, 2 drs. For purple tones: A, 1 oz.; B, 1 oz.; and C, 3 drs.

For red tones expose longer and use developer for purple tones.

LETO PHOTO-MATERIALS CO., LTD.

Edwards Plates.

"ISO" AND "ORDINARY" PLATES.

A.	Pyro Soda metabisulphite	• •	 1 oz. 1 oz. 20 ozs.	12·5 gms. 12·5 gms. 1000 c.c.s.
B.	Soda carbonate Soda sulphite Water		 3 ozs. 1 oz. 20 oz.	150 gms. 50 gms. 1000 c.c.s.

Use equal parts of A and B, adding 2 to 3 minims of 10 per cent. potass. bromide solution as necessary.

"SPECIAL TRANSPARENCY" LANTERN PLATE.

For Warm Tones.

A.	Pyro			1½ oz.	62.5 gms.
	Soda sulphite			5 ozs.	250 gms.
	Citric acid			140 grs.	16 gms.
	Water to make			20 ozs.	1000 c.c.s.
В.	Ammonium bromide			33 ozs.	187 gms.
	Liquor ammonia (.880)			21 ozs.	125 c.c.s.
	Water to make			20 ozs.	1000 c.c.s.
	Use:—A, 1 part;	B, 1	part;	water, 12	parts.

"KRISTAL" (GASLIGHT) LANTERN PLATES.

Developer for Warm Black Tones.

Hydroquinone	 	 120 grs.	14 gms.
Soda sulphite	 	 2 ozs.	100 gms.
Potass. carbonate	 	 4 ozs.	200 gms.
Potass. bromide	 	 40 grs.	4.5 gms.
Water to make	 	 20 ozs.	1000 c.c.s.

Use 1 part of the above mixed with 1 part of water. Development should be complete in about 2 minutes.

Leto Collodion Papers.

PLATINO-MATT.

For Brown-Black and Warm Black Tones.

The prints are first partly toned in the following gold bath. Toning must not be carried on too far, but only until the prints seem to have changed colour. A long immersion will yield blue-black and a short immersion brown-black tones in the subsequent platinum bath.

Shortly before use only, make up as follows:-

	_ L		
Acetate of soda	 	1 oz.	30 gms.
Gold chloride	 	1 gr.	0.065 gm.
Water	 	17 ozs.	530 c.c.s.

After toning, wash for a following platinum bath, un			
Phosphoric acid	 2 drs.	7·1 c.c.	S.
Chloroplatinite of po	$$ $7\frac{1}{2}$ grs $$ 9 ozs.		

Then wash in two to three changes of water and fix.

"Juno" Collodion P.O.P.

Toning Bath.

Ammonium sulphocyanide ... 90 grs. 0.3 gms. Odd chloride 20 ozs. 1000 c.c.s.

Fix for at least fifteen minutes in :—

Hypo ... 1 oz. | Water ... 15 ozs.

"PLUTO" COLLODIO-CHLORIDE PAPER.

Platinum Toning Bath.

Brown Tones.—Do not print so deeply as for black tones. Wash in four changes of lukewarm water, and immerse in a very weak ammonia bath (say \(\frac{1}{2} \) oz. to 40 ozs. water) until they turn a uniform lemon yellow. Wash out the ammonia from the prints in at least six changes of water, and tone in the above platinum bath, and fix as usual. (It is important that the prints be free from ammonia to avoid staining in the platinum bath.)

Excellent warm sepia tones are obtained by first washing the prints as usual, and placing direct into the fixing bath (hyposulphite of soda, 1 oz., water, 15 ozs.). Fix for 15 minutes, and wash for 1 to 13 hours in several changes. Printing must not be carried on so far as

for warm black tones.

Seltona (Self-Toning) Collodion Paper.

For Warm Brown Tones.

Soak the prints for a minute or two in clean water, and place in the fixing bath as follows:—

Hypo 2 ozs. 100 gms. Water 20 ozs. 1000 c.c.s.

(It is advisable to add a pinch of bicarbonate of soda to this solution.) Fix for at least 12 to 15 minutes, then wash for 1 hour in running water, or 8 to 10 changes.

Dark Brown, Purple and Blue Tones.

Rinse the prints rapidly in two or three changes of clean water, and place for 5 to 10 minutes in the following:—

or 4 good teaspoonfuls to ½ pint water. Rinse in clean water and fix as above.

Darker and bluer tones are obtained by placing the prints direct into the salt solution without previous washing. A stronger solution of salt up to 2 ozs. in 10 ozs. may be employed if desired.

Leto-Tintona Paper.

For sepia tones the prints are fixed in 1 in 20 hypo after washing.

For brown and purple tones, they are printed a little deeper and placed direct into—

Common salt 1 oz. 100 gms. Water 10.2s. 1000 c.c.s. 1000 c.c.s. for 10 minutes, being afterwards fixed and washed as for sepia tones.

For black tones, the paper is much over-printed and toned in—Citric acid 90 grs. 10 3 gms. Sodium chloride 90 grs. 10 3 gms. Potass. chloroplatinite ... 3 grs. 0 34 gm. Water 20 ozs. 1000 c.c.s.

This deep printing and platinum bath are also used for Leto "Chamois" paper.

Leto "Bromide" Paper.

Amidol Developer.

 Amidol
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An "acid" fixing bath is preferable: Soda sulphite, 14 oz.; water, 50 ozs., to which add, drop by drop, glacial acetic acid, 2 drachms; and then hypo, 8 ozs.

Leto-Gaslight Paper.

For Warm Black Tones.

 A. Adurol-Schering
 \$\frac{1}{2}\ \text{oz.}\$
 7·1 gms.

 Soda sulphite, cryst.
 \$\frac{2}{2}\ \text{ozs.}\$
 56·7 gms.

 Water
 \$12\frac{1}{2}\ \text{ozs.}\$
 350 c.c.s.

 B. Potass. carbonate.
 \$1\frac{1}{2}\ \text{oz.}\$
 42·5 gms.

 Water
 \$12\frac{1}{2}\ \text{ozs.}\$
 350 c.c.s.

Shortly before use, mix equal parts of each.

For Pure Black Tones.

It is advisable to give plenty of exposure, and develop quickly. When fully developed rinse and fix.

Leto Pigment Paper.

Sensitizer.

Ammonium bichromate	 450 grs.	50 gms.
Sodium carbonate (cryst.)	 90 grs.	10 gms.
Water, to make	 20 ozs.	1000 c.c.s.

For use, dilute one part with two parts of methylated spirit and use immediately.

THE LUMIERE CO.

Lumiere Plates and Films.

Dianol (Diamidophenol) Developer.

Sodium	sulphite	anhy	drous	 40 grs.	5 gms.
Dianol				 260 grs.	30 gms.
Water				 20 ozs.	1000 c.c.s.

This solution should be used quite fresh.

A stock solution of the soda sulphite and water may be made and the dianol added dry in proportionate quantity at time of using.

Lumiere's Citrate P.O.P.

Any of the ordinary toning methods may be employed, but the makers specially recommend the use of the following combined toning and fixing bath.

A.	Hypo	 	 5 ozs.	250 gms.
	Alum	 	 130 grs.	15 gms.
	Lead acetate	 	 17 grs.	2 gms.
	Warm water	 	 20 ozs.	1000 c.c.s.

Dissolve the hyposulphite and alum, and when cold add the lead acetate. Allow to stand for several hours, and then filter carefully.

B.	Gold chloride	 	 15 grs.	1 gm.
	Water	 	 31 ozs.	100 c.c.s.

To 100 parts of A add from 6 to 8 parts of B, according to tone required.

Separate Toning and Fixing.

Refined chalk				$1\frac{1}{2}$ oz.	80 gms.
1 per cent.	solution	of	gold		100
chloride				2 ozs.	100 c.c.s.
Distilled water	γ			20 078.	1000 c.c.s.

Allow to stand for 24 hours, then filter, and for use add 15 parts of above bath to 100 parts of water.

After toning, rinse prints and transfer to a 1 per cent. solution of alum for a few minutes, wash well, and fix in—

Fixing Bath.

Нуро	 	 3 ozs.	150 gms.
Soda bisulphite	 	 1½ dr.	10 c.c.s.
Alum	 	 30 grs.	3 gms.
Water	 	 20 ozs.	1000 c.c.s.

In this bath the prints will turn to a yellowish red, but will then change rapidly through brown to blue. Take the prints from the bath when the desired tone is obtained, and wash, preferably in running water.

Lumiere "Actinos" P.O.P.

Separate Toning.

A.	Sodium acetate Water		40 gms. 1000 c.c.s.
В.	Ammonium sulphocyanide Water	175 grs. 20 ozs.	20 gms. 1000 c.c.s.
C.	Gold chloride Water	15 grs. 3½ ozs.	1 gm. 100 c.c.s.
Mix	at time of use, A, 4 parts;	B, 4 parts; C, 1 part.	

Lumiere Bromide Papers.

The developer most recommended is a	s follows:—	
Sodium sulphite (anhydrous)	170 grs.	20 gms.
	45 grs.	5 gms.
10 per cent. solution of potass.		
bromide	20 to 50 min.	
Water	20 ozs.	1000 c.c.s.

This developer should be freshly made for each batch of prints, but should it be desired the soda solution can be made in bulk, and the diamidophenol added at the time of use.

Lumiere "Radios" (Gaslight) Paper.

Developer for Black Tones.

solution) ..

Water ...

Sodium sulphite (anhydrous) 5 to 7 drs. Dianol 40 grs. Potass. bromide (10 per cent. solution) 25 drops Water 20 ozs.	30 to 50 gms. 5 gms. 40 to 50 drops 1000 c.c.s.
For Warm Tones.	
Hydroquinone 5 drs. Formosulphite 14 drs. Potass. bromide (10 per cent.	10 gms. 25 gms.

.. 11 dr.

20 ozs.

10 c.c.s. 250 c.c.s. Taking as a standard exposure that correct for black tones with developer given, and as a standard developer the above given for warm tones, the exposure and dilution of the developer for various tones should be as follows:—

	Green	ish Blue.	Green.	Brown.	Sepia.	Red.
Exposure Addition of water		1	2		4	6
developer		0	1	2	3	7

Autochrome Plates.

For the new developing formulæ recommended by the makers see under "Colour Photography," in "Epitome of Progress." The other formulæ are as follows:—

Reversing Solution.

C. Potass. permanganate		2 gms.	70 grs.
Sulphuric acid	 	10 c.c.s.	6½ drs.
Water	 	1000 c.c.s.	80 ozs.

The sulphuric acid in C is the strong acid of 1 specific gravity. It should be added to the water, not vice versa.

Destroying Second Developer.

E. Solution C Water		20 c.c.s. 1000 c.c.s.	1 oz. 50 ozs.
	Intens	rifier.	
F. Pyro	• •	3 gms. 3 gms. 1000 c.c.s.	26 grs. 26 grs. 20 ozs.
G. Silver nitrate Distilled water	• •	5 gms. 100 c.c.s.	90 grs. 4 ozs.
	Clea	rer.	
H. Potass. permanganat Water		1 gm. 1000 c.c.s.	9 grs. 20 ozs.
	Fixing S	olution.	6
I. Нуро		150 gms.	3 ozs.

Potass. metabisulphite (7 gms. or 60 grs.) may be used in place o the soda bisulphite solution in making the fixing bath.

50 c.c.s.

1000 c.c.s.

1 oz.

20 ozs.

Soda bisulphite (solution)

Water

MARION AND CO., LTD.

Marion Plates.

("Supreme," "Academy," P.S., etc.)

PYRO-SODA DEVELOPER.

A. Pyrogallic acid	 	1 oz.	12.5 gms.
Sodium sulphite		8 ozs.	100 gms.
Sulphuric acid	 	60 minims	1.5 gm.
Water to make up	 	80 ozs.	1000 c.c.s.
B. Sodium carbonate	 	8 ozs.	100 gms.
Potassium bromide	 	60 grs.	1.5 gm.
Water to make up	 	80 ozs.	1000 c.c.s.

Mix in equal parts at time of using.

When very soft negatives are required or only a minimum exposure can be given, the bromide may be omitted.

PYRO-AMMONIA.

A.	Pyrogallic acid		1 oz.	100 gms.
	Ammonium bromide		1 oz.	100 gms.
	Citric acid		60 grs.	12 gms.
	Water to make up		10 ozs.	1000 c.c.s.
B.	Strongest liquid ammonia	(.880)	11 oz.	150 c.c.s.
	Water to make up		10 ozs.	1000 c.c.s.

Two ozs. (200 c.c.s.) of each of above separately made with water to 20 ozs. (1000 c.c.s.) form the solutions for use, equal parts being mixed together at the time of development.

Mariona P.O.P.

Toning Bath for Matt and Glossy.

A. Gold chloride solution, 1 gr. per oz. (2.3 gms. per 1000 c.c.s.).

B. Ammonium sulphocyanide solution, 10 grs. per oz. (23 gms. per 1000 c.c.s.).

Toning Bath.—A, 1 oz.; B, 1 oz.; water to 8 to 12 ozs.

For Glossy Only.

A. Gold chioride, as above.	
B. Sodium carbonate 30 grs.	
Water 15 ozs.	1000 c.c.s.
A, $2\frac{1}{2}$ ozs.; B, $2\frac{1}{2}$ ozs.; water to make 20 to 30 ozs.	
Platinum Toning for Matt P.O.P. and Mezzot	int Paper.
A. Water 15 ozs.	
Hydrochloric acid 5 minims	0.3 c.c.
Potass chloroplatinite 15 grs.	2.3 gms.
B. Citric acid 300 grs.	4.6 gms.
Sodium chloride 300 grs.	4.6 gms.
Water 15 ozs.	1000 c.c.s.
A, 1 oz.; B, 1 oz.; water to 30 ozs.	

Marion's Collodion P.O.P.

For Warm Black Tones-Platinum Toning Bath.

Potass chloroplatinite		 15 grs.	1 gm.
Phosphoric acid (sp. gr.	1.120) .	 2½ drs.	9 c.c.s.
Water		 35 ozs.	1000 c.c.s.

Remove prints as soon as they are of desired tone, which will be in from two to six minutes, according to age of bath. Wash well before fixing.

Blue-Black Tones-Gold Toning Bath.

Gold chloride	 	 2 grs.	0·13 gm.
Borax	 	 80 grs.	5 gms.
Water	 	 25 ozs.	700 c.c.s.

Make up two hours before use.

Keep prints in this bath until they assume a purple tone, then wash in several changes of water and transfer to platinum bath (given above). Remove when they reach a rich black.

Sepia Tones.

Wash prints in five or six changes of luke-warm water, to the last three of which add 1 per cent. of liquid ammonia 0.880 (not stronger, or blisters will be produced). When lemon-yellow wash in five or six changes of water and tone in the platinum bath. Wash and fix as usual.

Red Carbon Tones.

Wash prints i	in three	changes	of	water,	then	place in	8	bath of-
Common	salt						1	teaspoonful
Water							41	0 ozs.

As soon as they become yellow remove, rinse in water, and place in the borax gold bath. Just as they are reaching tone desired, again place them in salt bath to stop further toning, and, after rinsing in water, fix as usual.

Brown and Dark-Blue Tones.

Print dark, and treat as for red carbon tones, but tone in platinum bath only.

Purple Tones.

Print very dark. Wash in three changes of water and place in the following bath:—

Gold chloride (1 per cent. solu-

		1 oz.	10 c.c.s.
Acid hydrochloric p	oure	3 ozs.	30 c.c.s.
Water		10 ozs.	100 c.c.s.

Less acid gives a blue tone. More acid gives a purple tone. Tone until desired colour is obtained. Wash and fix as usual.

Marion's Bromide Paper.

Amidol Developer.

Amidol	40 grs.	4.6 gms.
Sodium sulphite	400 grs.	46 gms.
Potass. bromide	10 grs.	1·1 gm.
Water to make up to	20 ozs.	1000 c.c.s.

Or other standard developer.

Marion's "Quick Print (Gaslight)" Paper.

Amidol Developer.

Sodium	sulphite			 200 grs.	46 gms.
Amidol				 20 grs.	4.6 gms.
	bromide	(10%	solution)	 10 drops	35 drops
Water				 10 ozs.	1000 c.c.s.

Adurol Developer for Cold Tones.

Adurol	 	20 grs.	4.6 gms.
Sodium carbonate	 	200 grs.	46 gms.
Sodium sulphite	 	200 grs.	46 gms.
Potass. bromide	 	5 grs.	1 gm.
Water to	 	10 ozs.	1000 c.c.s.

Time of exposure with average negative, one inch magnesium ribbon burnt at one foot distant. Time of development, one minute.

For warm tones add extra bromide in proportion of 1 gr. per oz. (2.3 gms. per litre), and give exposure with average negative of six inches magnesium ribbon burnt to one foot distant. Time of development, four minutes.

Marion's Lantern Plates.

(Gelatino-Chloride and Chloro-Bromide.)

Hydrog	uinone	 	 15 grs.	3.4 gms.
Metol		 	 5 grs.	1·1 gm.
	sulphite		 200 grs.	45.6 gms.
	bromide	 		0.45 gm.
	hydrate	 • •	 20 grs.	4.6 gms.
Water	to make		10 ozs.	1000 c.c.s.

MAWSON AND SWAN.

Mawson Plates.

(" Mawson," " Castle," "Electric," "Felixi," and " Gladiator.")

Pyro-Soda Developer.

Stock Solution.

Pyrogallic acid	480 grs.	110 gms.
Potass. metabisulphite	120 grs.	28 gms.
Distilled water to make	10 ozs.	1000 c.c.s.
Dissolve the metabisulphite be	fore adding the other	ingredients.
A. Stock solution	1½ ozs.	125 c.c.s.
Distilled water to make	10 ozs.	1000 c.c.s.
B. Sodium carbonate (crystal) 360 grs.	82 gms.
Sodium sulphite	480 grs.	110 gms.
Distilled water to make	10 ozs.	1000 c.c.s.
Use equal parts of A and B.		

RODINAL DEVELOPER.

Rodinal	 	 	 	1 part
Water	 	 	 	20 parts

Mawson Ortho Plates, A. & B.

The above pyro-soda formula, with the addition of 40 grs. (9 gms.) potass bromide to the stock solution, gives excellent results.

If under-exposed, use a large proportion of B; if over-exposed, decrease the proportion of B, and add a few drops of a 10 per cent. solution of potass bromide.

AMIDOL DEVELOPER.

	Amidol			 100 grs.	23 gms.
	Soda sulphite			 1000 grs.	228 gms.
	Potass bromide			 10 grs.	2.3 gms.
	Distilled water to	make	to	 10 ozs. (fl.)	1000 c.c.s.
Use	1 part to 3 parts	water.		` '	

Mawson Photo-Mechanical Plates.

Pyro-Soda Developer.

The pyro-soda developer given above for Mawson "Castle" plates is used with the addition to the pyro stock solution of:

Potass bromide 160 grs. 38 gms.

HYDROQUINONE DEVELOPER.

A.	Hydroquinone	40 grs.	9 gms.
	Potass bromide	10 grs.	2 gms.
	Potass metabisulphite	40 grs.	9 gms
	Distilled water to make up to (fl.)	10 ozs.	1000 c.c.s.
В.	Caustic potash (sticks)	80 grs.	18 gms.
	Distilled water to make up to (fl.)	10 ozs.	1000 c.c.s.

Use equal parts of A and B mixed at time of developing.

Mawson X-Ray Plates.

A.	Metol		 40 grs.	9 gms.
	Hydroquinone		 80 grs.	18 gms.
	Potass. metabisulphite		 80 grs.	18 gms.
	Potass. bromide		 10 grs.	2.3 gms.
	Dist. water to make		 10 ozs.	1000 c.c.
B.	Sodium carbonate (cryst	(.;	 800 grs.	180 gms.
	CT 71 7 7 7 1		 800 grs.	180 gms.
	Dist mater to make		10 ozs.	1000 c.c.

Equal parts of A and B.

Mawson Lantern Plates.

A negative of average density requires about 15 seconds at 1 foot from a No. 6 bat's-wing burner.

Development begins rather slowly, especially with the hydroquinone formula, afterwards proceeding more rapidly.

PYRO-AMMONIA DEVELOPER.

A.				20 grs.	4.5 gms.
	Ammonium bromide			20 grs.	4.5 gms.
	Potass metabisulphite			50 grs.	11.5 gms.
	Distilled water to make	up to	(fl.)	10 ozs.	1000 c.c.s.
В.	Liq. ammonia (.880)			70 minims	15 c.c.s.
	Distilled water to make	up to	(fl.)	10 ozs.	1000 c.c.s.
TT	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				

Use equal parts of A and B mixed at time of developing.

HYDROQUINONE DEVELOPER.

A	. Hydroquinone		40 grs.	9 gms.
	Potass bromide		40 grs.	9 gms.
	Potass metabisulphite		40 grs.	9 gms.
	Distilled water to make up to	(.lh) c	10 ozs.	1000 c.c.s.
B.	Caustic potash (sticks)		80 grs.	18 gms.
	Distilled water to make up to	(.h) c	10 ozs.	1000 c.c.s.

Use equal parts of A and B mixed at time of developing.

Clearing Solution.

Hydrochloric acid		½ oz. (fl.)	50 c.c.s.
Saturated solution of	alum, to	10 ozs. (fl.)	1000 c.c.s.

SULPHOCYANIDE TONING SOLUTION.

(For Blue-Black and Blue Tones.)

A. Gold chioride	 15 grs.	I gm.
Distilled water to make up	 71 ozs. (fl.)	212 c.c.s.
B. Ammonium sulphocyanide	 40 grs.	3 gms.
Distilled water to make up	 4 ozs. (fl.)	113 c.c.s.

Use 1 part of A and 4 parts of B, mixed at time of using. This order of mixing must not be reversed.

SIMPLEX LANTERN PLATES.

Developer for Black Tones.

Amidol	 100 grs.	20 gms.
Sodium sulphite	 1000 grs.	200 gms.
Potass. bromide	5 grs.	1 gm.
Distilled water to make .	 10 ozs.	1000 c.c.s.

Use 1 part to 4 parts of water.

OZOBROME, LIMITED.

THE OZOBROME PROCESS.

Carbon Prints from Bromides.

If fixed in the ordinary bath, the bromides should be hardened in—
Formalin 1 part water 10 parts,
or—

Chrome alum..... 4 per cent. solution, in either case for ten minutes, and then washed for 15 minutes and dried.

Stock Acid Solution.

Acid Bath .-- B.

Hydrochlori	c acid	(pure)	 1 oz.	100 c.c.s.
Water .			 10 ozs.	1000 c.c.s.

Working Acid Solution.

Water		 	25 ozs.	1000 c.c.s.
Stock acid	solution	 	1 oz.	40 c.c.s.

Pigmenting Bath .- A.

Concentrated	ozobrome	solution	(as sold)	 1 part
Water				 4 parts

Place the bromide print face upwards in cold water and sponge the surface to remove air bells. Immerse the pigment plaster in bath A until saturated (about 90 seconds) and then transfer to B for 5 to 15 seconds. Less immersion in acid gives greater contrast. Drain the plaster for a few seconds and apply to the bromide in the dish of water, place on a flat support and squeegee together with a flat squeegee. After 20 minutes' contact the plaster may be developed on the bleached bromide or transferred to another support.

BROMOIL AND OIL-OZOBROME.

See under these processes in "Epitome of Progress" for the use of the Ozobrome solution,

THE OZOTYPE PROCESS.

Instructions for the Ozotype process were given in the "1907 Almanac," page 1047.

PAGET PRIZE PLATE COMPANY, LTD.

Paget Plates.

(XXXXX, "Swift," XXX, and "Special Rapid.")

PYRO-SODA.

No. 1. Pyrogallic acid	 	½ oz. 5 minims	25 gms.
Sulphuric acid			1.0 c.c.
Distilled water to make	 	10 ozs.	1000 c.c.s.
No. 2. Carbonate of soda	 	2 ozs.	200 gms.
Sulphite of soda		2 ozs.	200 gms.
Potass. bromide		60 grs.	14 gms.
Distilled water to make	 	10 ozs.	1000 c.c.s.

For studio use, 1 part of each and 2 parts of water (making 4 parts altogether) will be found about right. Such developer contains about 3 grs. pyro and 22 grs. each of carbonate and sulphite to each oz.

METOL-HYDROQUINONE.

Hydroquinone	 	 55 grs.	6 gms.
Metol	 	 14 grs.	1.5 gm.
Soda sulphite	 	 1 oz.	48 gms.
Soda carbonate	 	 14 oz.	60 gms.
Potass. bromide	 	 20 grs.	25 gms.
Water to make	 	 20 oz.	1000 c.c.s

Dissolve the sulphite in half the water, heated to about 150°, dissolve the hydroquinone in this and then add the metol, already dissolved in 20 times its weight of water. Dissolve the bromide and carbonate in about a quarter of the water, add this solution to the above and make the whole up to the required bulk with water.

Paget P.O.P.

Toning—The following bath is strongly recommended in preference to any other:—

Ammonium sulphocyanide	24 grs.	3.4 gms.
Gold chloride	2 grs.	0·28 gm.
Water	16 ozs.	1000 c.c.s.

If it is desired to tone more slowly, a small quantity of sulphite of sodium, equal in quantity to the gold used, should be added to the toning bath. This makes the bath work more slowly without making any other difference.

For decidedly warm tones (really pure light browns and red browns)

the following formula is recommended :-

Gold chloride	1 gr.	0·15 gm.
Ammonium sulphocyanide	8 grs.	11.5 gms.
Sodium sulphite	1 gr.	0·15 gm.
Water to make	16 ozs.	1000 c.c.s.

Tone to the desired colour, judging by looking through. Toning is slow, taking from 5 to 10 or 12 minutes. When toned, wash the prints in water, fix and finish as usual.

Developing.

The Paget "partial development" process is given under "Standard Formulæ for the Principal Photographic Processes."

Paget Collodion Papers.

COLLODIO-CHLOBIDE P.O.P.

Gold Toning.

Ammonium sulphocyanide	30 g	
Gold chloride	2 gr	
Water	16 o	zs. 450 c.c.s.

PLATINOID C.C. PAPER.

A. Gold chloride	 15 grs.	2 gms.
Water	15 ozs.	1000 c.c.s.
B. Soda bicarbonate Distilled water	 120 grs. 15 ozs.	16 gms. 1000 c.c.s.

For use, take 1 part A, 1 part B, and 28 parts water. The mixture does not keep; only enough for use should therefore be made up from A and B as required.

Tone prints to a chocolate or reddish purple colour. Wash for five minutes. Then tone again in—

Potass. chloroplatinite		15 grs.	0.5 gm.
Dilute phosphoric acid	(Acid		
Phosph. dil. B.P.)		3 ozs.	50 c.c.s.
Water to make		60 ozs.	1000 c.c.s.

If a bluer black is desired it may be obtained by using $\frac{1}{2}$ oz. of lactic acid in the second bath instead of 3 ozs. phosphoric acid.

The prints should remain in this bath until quite black. They are then washed and fixed as usual.

A very fine brown black may be obtained by the use of the chloroplatinite bath only. In this case the print should be placed, after first washing, in weak ammonia (say ½ oz. liquor ammonia 0.880 to the pint of water) for a few seconds, then washed again for a minute and toned.

Paget Self-Toning Papers.

COLLODION.

For warm brown tones wash print for 5 minutes and fix in-

Hypo Water	 	 3 ozs.	150 gms. 1000 c.c.s.

for 10 minutes; wash thoroughly and dry. If a colder tone be desired, instead of first washing, place print in—

Common salt .. , 2 ozs. 100 gms. Water 20 ozs. 1000 c.c.s.

for 5 minutes, then rinse in water and fix as above,

Platinum Toning.

A fine olive black tone can be obtained in the following way-Potassium chloroplatinite .. 15 grs. 1 gm. .. 150 grs. .. 150 grs. Sodium chloride 10 gms. Citric acid 10 gms. Water to make 7½ ozs.

For use, take 1 part of stock solution and 10 parts water.

The prints are first put into a bath of common salt 1 oz., water 10 ozs., for 5 minutes, washed, and then placed in the platinum bath and kept constantly moving, until all trace of red has disappeared from the print when it is looked through. This will take from 5 to 10 minutes. Wash again for 5 minutes and fix in the ordinary hypo fixing bath.

GELATINE ("SIMPLEX").

For coldest purple, fix in hypo, 8 ozs. in 20 ozs., for 6 or 7 minutes.

" warmer " " , " 8 to 4 " , " 6 " 7 sepia " 22 10 " brown or red 15

Fixing should be timed fairly close to above directions, and bath should be about 65° F.

Paget Phosphate Paper.

See under "Phosphate Papers" in "Epitome of Progress."

Paget Bromide Papers.

Metol	 	 80 grs.	9·1 gms.
Hydroquinone	 	 40 grs.	4.6 gms.
Soda sulphite	 	 14 ozs.	62.5 gms.
Potass. bromide		 10 grs.	1·1 gms.
Potass. carbonate	 	 ½ oz.	25 gms.
Water to make	 	 20 ozs.	1000 c.c.s.

This developer is made up in the order directed for the metolhydroquinone solution for Paget plates on an earlier page.

The image should appear very quickly, and development will be complete in about 2 to 3 minutes. Rinse in 3 changes of water and fix.

To produce softer results the developer may be diluted with an equal quantity of water, or the hydroquinone may be omitted or reduced.

"Gravura" (Gaslight) Papers.

FOR BLACK TONES, WITH NO. 1 OR NO. 2 PAPER.

*** 1 1 1	 • • •	8 ozs. 10 ozs. 16 grs. 160 ozs.	6 gms. 48 gms. 60 gms. 0 25 gm. 1000 c.c.s.
		(1 gallon)	

The above formula gives good gradation and an excellent black tone,

but it cannot be used for colours. Development is complete in about 10 to 20 seconds.

For prevention of stress marks add to each ounce of developer at time of use about 15 minims of :—

Potass. cyanide 200 grs. 22 gms. Water 20 ozs. 1000 c.c.s.

WARM TONES, WITH NO. 2 PAPER ONLY.

H. Hydroquinone	 l oz.	55 grs.	6 gms.
	 doz.	14 grs.	1.5 gm.
Sodium sulphite	 8 ozs.	l oz.	48 gms.
Sodium carbonate	 10 ozs.	11 oz.	60 gms.
Potass bromide	 16 grs.	2 grs.	0.25 gm.
Water to make	 160 ozs.	20 ozs.	1000 c.c.s.
	(1 gallon)		

A.C. Ammonium bromide . . . 1 oz. 50 gms.

Ammonium carbonate . . . 1 oz. 50 gms.

Water to make 20 ozs. 1000 c.c.s.

Development for Colours.

Cool to Warm Sepias. Exposure-5 to 6 times Black.

Stock solution H	 1 oz.	30 c.c.s.
Stock solution A.C.	 50-60 min.	3-3.5 c.c.s.
Water to make	 6 oz.	170 c.c.s.

Warm Brown to Red. Exposure—6 to 8 times Black.

Stock solution H	 1 oz.	30 c.c.s.
Stock solution A.C.	 4 OZ.	7 c.c.s.
Water to make	 8 ozs.	230 c.c.s.

Red chalk. Exposure-8 to 10 times black.

Stock solution H	 1 oz.	30 c.c.s.
Stock solution A.C.	 1 oz.	15 c.c.s.
Water to make	 20 ozs.	570 c.c.s.

Red development may take 5 minutes or more.

Clearing Solution.

To remove friction marks and improve colour and clearness of prints.

No. 1. Hypo		 	 1 oz.	50 gms.
Water		 	 20 ozs.	1000 c.c.s.
No. 2. Potass. Water	ferricya	• •	30 grs.	14 gms.

For use, add $\frac{1}{2}$ drachm of No. 2 to each ounce of No. 1, and lay the print in the mixture, in a clean dish. The marks can then be easily removed by gentle rubbing with a pad of cotton wool. Wash and dry the print as usual.

"Paget" Lantern Plates.

No. 1. Hydroquinone	 ½ oz.	25 gms.
Sulphurous acid B.P.	 ½ oz.	12.5 gms.
Potassium bromide	 60 grs.	6.8 gms.
Water to	 20 ozs.	1000 c.c.s.
No. 2. Caustic soda	 ½ oz.	25 gms.
Sodium sulphite		125 gms.
Water to	 20 ozs.	1000 c.c.s.

For Warm Tones.

No. 3. Bromide of ammonium	1 oz.	50 gms.
Carbonate of ammonium	1 oz.	50 gms.
Water to	20 ozs.	1000 c.c.s.

Carbonate of ammonium should be in clear lumps; if from exposure to the air it has become coated with the white powdery bicarbonate, the latter should be scraped off.

The following table shows how the developer should be used for black and warm tones:—

Relative Time of Exposure.	Constitution of Developer.	Time of Development.	Colour of Deposit.
30 secs	No. 1 $\frac{1}{2}$ oz. No. 2 $\frac{1}{2}$ oz. Water to make 2 ozs.	$2\frac{1}{2}$ to 3 minutes.	Black
One minute	No. 1 ½ oz. No. 2 ½ oz. No. 3 100 minims Water to make 2 ozs.	5 minutes	Brown
One and a half minutes	No. 1 ½ oz. No. 2 ½ oz. No. 3 200 minims Water to make 2 ozs.	10 minutes	Purple brown
Three minutes	No. 1 ½ oz. No. 2 ½ oz. No. 3 250 minims Water to make 2 ozs.	12 minutes	Purple
Five minutes	No. 1 ½ oz. No. 2 ½ oz. No. 3 300 minims Water to make 2 ozs.	15 minutes	Red

"Gravura" (Gaslight) Lantern Plates,

For black tones, these are developed with the second (H) formula given above for "Gravura" paper. For warm tones, in every case the water added should be only half the quantity mentioned.

RAJAR, LTD.

"Rajar" Plates.

Developer.

A. Pyro Potass. metabisulphite Water		½ oz. ½ oz. 40 ozs.	25 gms. 12·5 gms. 1000 c.c.s.
B. Soda sulphite Soda carbonate Potass. bromide Water	• • • • • • • • • • • • • • • • • • • •	2 ozs. 2 ozs. 5 grs. 20 ozs.	100 gms. 100 gms. 0·6 gm. 1000 c.c,s.

Use equal parts of A and B.

Cleron Roll and Flat Films.

A.	Potass. metabisulphite	 	30 grs.	3.5 gms.
	Pyro		₺ oz.	12.5 gms.
	Water	 	20 ozs.	1000 c.c.s.
В.	Sodium carbonate	 	2 ozs.	100 gms.
	Sodium sulphite	 	2 ozs.	100 gms.
	Potass. bromide	 	10 grs.	1 gm.
	Water	 	20 ozs.	1000 c.c.s.

For correct exposure, A, 1 part; B, 1 part.

For under-exposure, A, 1 part; B, 2 parts; water, 1 part.

For over-exposure, A, 2 parts; B, 1 part, with 10 to 20 drops 10 per cent. potass. bromide solution per ounce of mixed developer.

"Rajar" P.O.P.

Toning Bath.

Ammonium sulphocyanide	20 grs.	2.3 gms.
Gold chloride	2 grs.	0.23 gm.
Water	20 028.	1000 c.c.s.

This bath produces dark brown to purple black tones, but if warm

tones are desired it is advisable to dilute the bath with the following solution:—

Sodium a	ulphite	 • •	 2 grs.	0.23 gm.
Water		 	 20 ozs.	1000 c.c.s.

SEPIA TONES ON MATT PAPER.

Stock Solutions.

510	on Doracio	1103.	
		15 grs.	1 gm.
Water		15 ozs.	425 c.c.s.
Hydrochloric acid		5 drops	5 drops
Mix the acid with the water	and add t	he chloroplati	nite.
B. Citric acid		400 grs.	45 gms.
Common salt		400 grs.	45 gms.
Water		20 ozs.	1000 c.c.s.
Toning bath: -A, 1 oz.; B,	1 oz.; wa	ter, 15 ozs.	

"Rajar" C.C. Paper.

	h and to							
	Ammon Gol d ch					21 grs. 4 grs.	1·4 gm. 0·26 gm.	
	Water					25 ozs.	710 c.c.s.	
				Matt	Paper			
Prin	t till sh	adows b	ronze,	wash	and t	one in-		
	Sodium	acetate				100 grs.	11.4 gms.	
	Gold ch	loride				2½ grs.	0·28 gm.	
	Water	• •				20 ozs.	1000 c.c.s.	
again v	vashing	and tor	ning in	_				
	Citric ac					150 grs.	17·1 gms.	
	Potass.					10 grs.		
	Water					20 grs.	1000 c.c.s.	

"Rajar" Self-toning P.O.P.

When printed fix in the baths described below, then wash for an hour in water.

Depth of Printing.	Fixing bath. To the pint water	Time.	Tone.			
Very dark (shadows blocked) Fairly deep		6 ozs. hypo. 3 ozs. hypo. 2 ozs. hypo. 1 oz. hypo.		6 minutes 10 minutes 10 minutes 15 minutes		Purple. Sepia. Brown. Red brown.

For purple-brown to purple tones, particularly when printing from thin negatives, place prints without washing in-

Ammonium	n sul	phocys	nide	 20 grs.	2.3 grs.
Water				 20 ozs.	1000 c.c.s.

for 3 to 5 minutes, wash for 7 minutes in running water, and fix for 10 minutes in 1:10 hypo.

The gold-platinum toning given above for ordinary P.O.P. serves well for black and olive-black tones on the matt self-toning paper.

"Rajar" Bromide Paper.

Developer.

Metol	 	8 grs.	0.9 gm.
Hydroquinone	 	30 grs.	3.5 gms.
Sodium sulphite	 	3 oz.	37.5 gms.
Sodium carbonate	 	3 oz.	37.5 gms.
Potass bromide	 	20 grs.	2.3 gms.
Water	 	20 ozs.	1000 c.c.s.

"Rajar" Gaslight Papers.

Developer for Black Tones on Ordinary and "Varecolor,"

Potass. meta	bisulphite	 	20 grs.	2.3 gms.	
Metol .		 	16 grs.	1.8 gms.	
Hydroquino			60 grs.	6.8 gms.	
Sodium sulp			480 grs.	55 gms.	
Sodium carb		 	800 grs.	91 gms.	
Potass brom	ide		2 grs.	0.2 gm.	
Water .		 	20 ozs.	1000 c.c.s.	

WARM TONES ON "VARECOLOR."

Water	 	 20 ozs.	1000 c.c.s.
Soda sulphite	 	 2½ ozs.	125 gms.
Soda carbonate	 	 5 ozs.	250 gms.
Hydroquinone	 	 150 grs.	17 gms.
Potass. bromide	 	 100 grs.	11.4 gms.

Tone required.	Times	Exposures, for Black	Developer. Tone.	
Green-black	 	same	D, solution	
Sepia	 	2	D. 1 oz.; water, 3 ozs.	
Brown	 	4	D, 1 oz.; water, 10 ozs	
Red chalk	 	6	D. 1 oz.: water, 20 ozs.	

ROTARY PHOTOGRAPHIC CO., LTD.

"Rotograph" Negative Paper.

A.	Ortol Potass. metabisulphite Water	• •	1 oz. ½ oz. 60 ozs.	16·5 gms. 8·2 gms. 1000 c.c.s.
В.	Sodium carbonate Sodium sulphite Water	••	 12 ozs. 8 ozs. 60 ozs.	200 gms. 130 gms. 1000 c.c.s.

For use take A, 1 part; B, 1 part; water to make 10 parts.

This developer is most suitable when working from harsh transparencies since, like amidol, it tends to softness. The best developer for negative paper is ferrous oxalate or ferrous citrate.

The paper should be fixed in an "acid" bath.

When dry, it is sufficiently transparent to print quickly without further treatment. If, however, great transparency is required, the following mixture should be rubbed into the back of the paper with cotton wool.

Canada balsam	 	 	 1 oz.
Turpentine	 	 	 5 ozs.

"Roto" P.O.P.

Toning.

				wivy.		
A.	Ammonium sul	phocya	nide		1 oz.	100 gms.
	Water to make				10 ozs.	1000 c.c.s.
B.	Gold chloride				15 grs.	17.0 gms.
	Water				15 drs.	1000 c.c.s.

For purple tones, A, 3 drams; water, 20 ozs.; B, 11 drams. For warm brown tones, A, 2 drams; sodium sulphite, 1 gr.; water, 20 ozs.; B, 1 dram.

FOR MATT P.O.P.

Sodium acetate	 	 60 grs.	4 gms.
Borax	 	 80 grs.	5.2 gms.
Gold chloride	 	 2 grs.	0·13 gm.
Water to make	 	 35 ozs.	1000 c.c.s.

"Rotary" Collodio-Chloride P.O.P.

Toning Baths for the Matt Paper.

	Sodium acetate Chloride of gold		• •	96 grs. 2½ grs.	2 gms. 5 c.c.s. of 1%
,	Distilled water			20 ozs.	solution.
	Distilled Water	 		ZU UZN.	400 G.G.S.

Make this bath up several hours before use.

The prints should be toned in this bath only until they commence

to change colour. Then wash thoroughly for a few minutes and place in-

Potassium chloroplatinite .. 12 grs. Citric acid, pure 180 grs. 15 gms. Distilled water ... 20 ozs. 800 c.c.s.

Make this bath up about an hour before use.

The prints should remain till the desired tone is attained. The tone passes from red to brown, brownish-black, blue-black to pure black.

Very fine warm and permanent tones, somewhat similar to platinum prints, may be obtained merely by use of the above platinum bath. without the preliminary gold bath.

Red, sepia, and violet tones can be obtained by short or long toning

with the gold bath alone.

Toning Bath for the Glossy Paper.

After washing, the prints should be immersed in the following toning bath :-

Sodium acetate (fused)	 530 grs.	5.5 gms.
Ammonium sulphocyanide	 48 grs.	0.5 gm.
Distilled water	 20 ozs.	100 c.c.s.
Chloride of gold	 1 3 gr.	6 to 8 c.c.s. of
		1% solution.

Make this bath up several hours before use.

Tone to any point the finished prints are required to be, wash, fix and wash.

"Rotona" P.O.P.

Prints are fixed for not less than 8 minutes in 20 per cent. hypo

containing a little bicarbonate of soda.

For colder tones, use stronger hypo solution, up to 30 per cent., or without preliminary rinse, place prints in a solution of ordinary salt (2 ozs. of salt to 20 ozs. of water) for 3 to 5 minutes; then fix and complete the print in 20 per cent. hypo as given above for warm

Considerable variation of tones is obtainable by altering the strength of salt and hypo, whether for cold or warm tones, but the above quantities are the minimum to be used for yielding permanent results.

"Rotograph" Bromide Papers.

Metal. Hudroguinone Developer

mm 0 4	2 2 2 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	,00,00	Doctor Por	
Metol			50 grs.	5.7 gms.
Hydroquinone			40 grs.	4.6 gms.
Sodium sulphite			500 grs.	57 gms.
Potass. bromide			25 grs.	2.9 gms.
Sodium carbonat			500 grs.	57 gms.
Water (distilled	or boiled) to	0 0	20 ozs.	1000 c.c.s.

Amidol Developer.

Sodium sulphite	 	 200 grs.	23 gms.
Potass. bromide	 	 1 gr.	0·1 gm.
Amidol	 	 20 grs.	0.7 gm.
Water to	 	 6 ozs.	1000 c.c.s.

Dilute 1 part of the above with 4 parts of water, and apply to the paper; as soon as the shadows have developed pour off, and apply the strong solution till sufficient density is obtained; then pour off, wash well, and fix. This method gives rich blacks with brilliant whites.

"Rotox" (Gaslight) Paper.

Rodinal Developer.

Rodinal					1 oz.	50 c.c.s.
Water					20 ozs.	1000 c.c.s.
Add a faw dron	ng 100/	bromid	a golini	tion	as required	

Metol-Hydroquinone.

Sodium carbonate	 	 2½ ozs.	125 gms.
Sodium sulphite	 	 l oz.	50 gms.
Metol	 	 16 grs.	1.8 gm.
Hydroquinone	 	 55 grs.	6.3 gms.
Potass. bromide	 	 3 grs.	0.35 gm.
Water	 	 20 ozs.	1000 c.c.s.

Development takes place very quickly. If correctly exposed, th print attains full density in 5 to 10 seconds.

THE CARBOGRAPH PROCESS.

For this process of pigment printing and enlarging direct see under "Epitome of Progress," 1909 "Almanac," p. 669.

W. W. ROUCH AND CO.

Developer Stock Solutions.

A. Pyro	 	 1 oz.	100 gms.
Sodium sulphite		 4 ozs.	400 gms.
Water to make	 	 10 ozs.	1000 c.c.s.

Dissolve the sulphite of soda in hot water, and, when cold, add the pyrogallic acid.

B. Ammonium brom	ide	1 oz.	100 gms.
Water to make		10 ozs.	1000 c.c.s.
C. Liquor ammonia Water to make	(· 8 30)	3 ozs. 10 ozs.	300 c.c.s. 1000 c.c.s.

R. W. THOMAS & CO., LTD. Thomas's Lantern Plates.

For Black and Warm Tones.

L'OF Diach are:	b Walle Lowes.
No. 1. Hydroquinine	160 grs. 10 gms. 2 ozs. 60 gms. 60 grs. 4 gms. 40 grs. 2½ gms. 20 ozs. 600 c.c.s.
No. 2. Sodium hydrate Water to	160 grs. 10 gms. 20 ozs, 600 c.c.s.
No. 3. Ammonium bromide Water to	2 ozs. 60 gms 20 ozs. 600 c.c.s.
No. 4. Ammonium carbonate Water to	2 ozs. 60 gms. 20 ozs. 600 c.c.s.
For Black Tones.	For Brown Tones.
No. 1 \(\frac{1}{2}\) oz. 15 c.c.s.	No. 1 \(\frac{1}{2}\) oz. 15 c.c.s.
No. 2 3 oz. 15 c.c.s.	No. 2 $\frac{1}{5}$ oz. 15 c.c.s.
Water to . 2 ozs. 60 c.c.s.	No. 3 15 minims 1 c.c.
77 dt 01 t 0	No. 4 15 minims 1 c.c.
	Water to 2 ozs. 60 c.c.s.
77 To 1 M	
For Purple Tones.	For Red Tones.
No. 1 ½ oz. 15 c.c.s.	No. 1 ½ oz. 15 c.c.s.
No. 2 15 c.c.s.	No. 2 ½ oz. 15 c.c.s.
No. 3 30 minims 2 c.c.s.	No. 3 90 minims 6 c.c.s.
No. 4 30 minims 2 c.c.s.	No. 4 90 minims 6 c.c.s.
Water to 2 ozs. 60 c.c.s.	Water to 2 ozs. 60 c.c.s.
Mha valatina times of amanus	and dayslanment for these tones

The relative times of exposure and development for these tones are—

	Black.	Brown.	Purple.	Red.
Exposure	30 secs. at	30 secs. at	30 secs. at	60 secs. at
	24 in.	6 in.	5 in.	5 in.
Development	4 minutes	10 minutes	18 minutes	30 minutes

WARWICK DRY PLATE CO.

("Special Rapid," "Double Instantaneous," "Rainbow," and "Warpress" plates.)

A.	Pyro	 	 	1 oz.	12.5 gms.
	Nitric acid	 	 	20 drops	10 drops.
	Water	 	 	80 ozs.	1000 c.c.s.

B. Soda sulphite	 10 ozs.	112.5 gms.
Soda carbonate, crystal	 9 ozs.	125 gms.
Water	 80 ozs.	1000 c.c.s.

For correct exposure, use equal parts of A and B.

For under-exposure, use more B.

For over-exposure, use more A, or add a few drops of 10 per cent. potass. bromide solution.

For correct exposure, no bromide is necessary.

HYDROQUINONE.

No. 1. Water		20 ozs.	1000 c.c.s.
Hydroquinone		120 grs.	14 gms.
Sodium sulphite		2 ozs.	100 gms.
No. 2. Water		20 ozs.	1000 c.c.s.
Potass. carbonate		4 oz.	200 gms.
Potass. bromide		30 grs.	3.5 gms.
The same takes as well market of a	a a b		

For use take equal parts of each.

WELLINGTON AND WARD.

Wellington Plates.

("Speedy," "Iso Speedy," and "Landscape.")

Pyro-Ammonia Developer.

No. 1.	Pyrogallic acid	 	1 oz.	100 gms.
	Sodium sulphite	 	2 ozs.	200 gms.
	Citric acid	 	40 grs.	9.2 gms.
	Water to	 	10 ozs.	1000 c.c.s.
No. 2.	Ammonia (0.880)	 	1 oz.	100 c.c.s.
	Water to	 	10 ozs.	1000 c.c.s.
No. 3.	Ammonium bromide	 	l oz.	100 gms.
	Water to	 	10 ozs.	1000 c.c.s.

Take 10 minims (2 c.c.s.) of No. 1, 10 minims of No. 2, and 5 minims (1 c.c.) of No. 3 to each ounce (100 c.c.s.) of water.

Pyro-Soda Developer.

No. 1.	Pyrogallic acid		 	1 oz.	100 gms.
	Sodium sulphite		 	2 ozs.	200 gms.
				40 grs.	9.2 gms.
	Water to		 	10 ozs.	1000 c.c.s.
No. 2.	Sodium carb nat	е	 	8 ozs.	100 gms.
	Sodium sulphite			8 ozg.	100 gmg

Water to 80 ozs. 1000 c.c.s.

Normal Work.—Take 1 oz. of No. 2 and 1 dr. of No. 1, with water

Studio Work.—Take 1 oz. of No. 2 and $\frac{1}{2}$ dr. of No. 1, with ater 1 oz.

" PRESS" PLATE.

Metol-Hydroquinone Developer.

			-	_	
A.	Water		 	 40 ozs.	1000 c.c.s.
	Metol		 	 70 grs.	4 gms.
	Hydroqu			 100 grs.	5.7 gms.
	Soda su	lphite	 	 4 ozs.	100 gms.
B.	Water		 	 40 ozs.	1000 c.c.s.
	Soda car	bonate	 	 6 ozs.	150 gms.
					0

Equal parts of A and B.

WELLINGTON "ORTHO PROCESS" PLATES.

Hydroquinone Developer.

Hydrog	uinone	 	80 grs.	9·1 gms.
	sulphite		_	50 gms.
Potass.	hydrate	 	80 grs.	9·1 gms.
Potass.	bromide	 	10 grs.	1·1 gm.
Water		 	20 ozs.	1000 c.c.s.

Pyro-Soda.

No. 1.	Pyrogallic acid	 	 1 oz.	100 gms.
	Sodium sulphite	 		200 gms.
	Citric acid	 		9·1 gms.
	Water to	 	 10 ozs.	1000 c.c.s.

Sodium sulphite Potass. bromide	•••••	8 ozs. 8 ozs. 40 grs.	100 gms. 100 gms. 1·1 gm.
Water to		80 ozs.	1000 c.c.s.

No. 1, 1 dr.; No. 2, 1 oz.

"WELLINGTON" ROLL-FILMS.

The pyro-soda developer for "Speedy" plates is used for the films, using—No. 1, 1 drachm; No. 2, 1 oz.; water, 1 oz.

For over-exposed negatives, add 10 to 20 drops of 10% bromide solution per 4 ozs. of developer.

WELLINGTON "WATALU" PLATES. (Self-developing.)

"DEVELOPER."

For a quarter-plate	 	 1 oz. of water
For a half-plate	 	 2 ozs. of water
For a whole-plate	 	 4 ozs. of water

For normal exposure it is best to have the water at a temperature of 60 deg. Fahr. Gently rock the dish for the first minute or two, in order to assist the soluble backing to dissolve.

For under-exposure add three to four times the original quantity of water, raise the temperature of same to 70 deg. Fahr., and continue development for 15 minutes.

"Wellington" P.O.P.

ORDINARY.

Formate Toning Bath.

Sodium formate	 15 grs.	0.85 gm.
Sodium bicarbonate	 3 grs.	0·17 gm.
Gold chloride	 2 grs.	0.11 gm.
Water (distilled)	 40 ozs.	1000 c.c.s.

The bath is ready for use as soon as made up; it will not keep.

Phosphate Toning Bath.

Phosphate of soda	 (60 grs.	3.4 gms.
Gold chloride		2 grs.	0·11 gm.
Water	 	40 ozs.	1000 c.c.s.

This bath should be allowed to stand one hour before using; it will not keep. The above quantity is sufficient for 24 half-plates.

"WELLINGTON" SPECIAL AND "CARBON" P.O.P.

Well wash the prints previous to immersion in the toning bath.

Ammonium sulphocyanide	20 grs.	2.8 gms.
Gold chloride	2 grs.	0.3 gm.
Water	16 ozs.	1000 c.c.s.

The tone is to be entirely judged by the surface, and not by looking through the print. Always undertone, as the finished print becomes very much colder when dry.

"Wellington" Self-Toning Paper.

Immerse prints direct, without washing, in the following :-

Hyposul	hite o	f soda	 	6 ozs.	300 gms.
Water			 	20 ozs.	1000 c.c.s.

The fixing bath should be rendered alkaline by the addition of 30 grains (3.5 gms.) of bicarbonate of soda, which prevents sulphur toning and ensures greater permanency of the print.

Fix until desired tone is reached, which should not be less than eight minutes; then wash thoroughly.

"Wellington" Bromide Papers.

Amidol is recommended as the most reliable developer for general purposes, although any other may be used.

, 0	9	 	
Amidol	 	 50 grs.	5.7 gms.
Soda sulphite	 	 650 grs.	74 gms.
Potass. bromide	 	 10 grs.	1.1 gm.
Water	 	 20 ozs.	1000 c.c.s.

This developer should be used within three days of mixing.

It is often recommended to keep a stock solution of sodium sulphite by itself, and to take some of this when wanted and add the amidol to it. Experience shows that this will not do, as amidol when used with stale sulphite solution develops very slowly, and there is a great loss of brilliancy in the resulting prints. The developer given above should therefore be mixed up as directed, and used within three days of mixing.

Metol-Hydroquinone Developer.

Metol	 	 50 grs.	6 gms.
Hydroquinone	 	 15 grs.	1.7 gm.
Sulphite of soda	 	 500 grs.	57 gms.
Potass bromide	 	10 grs.	1·1 gm.
Potass carbonate	 	 100 grs.	11 gms.
Water	 	 20 ozs.	1000 c.c.s.

Dissolve the metol in the water first.

CLEARING AND REDUCING BROMIDE PRINTS.

In clearing up and brightening up a bromide print, removing surface markings or yellow stains or slight fog, the following bath will be found of great service. It should be applied after fixing and washing, the prints being left in until the desired clearing has taken place, and then removed and well washed.—

Thiocarbamide	 	 20 grs.	4.6 gms.
Citric acid	 	 10 grs.	2.3 gms.
Water	 	 10 ozs.	1000 c.c.s.

This bath will not work unless all traces of hypo have been removed from the print.

BRIGHT PRINTS FROM VERY WEAK NEGATIVES.

The following method will be found to give bright vigorous prints from flat negatives when every other means has failed:—

Expose the bromide paper in the usual way, developing it as long as any increase in depth is seen to be gained, ignoring altogether the discolouration of the high-lights—over-develop it, in fact. After fixing and washing, pour over it the following reducing solution until it is seen to be considerably lighter; when it is, at once plunge into clean hypo for a few minutes. If it is not yet light enough it may be again washed, treated with reducer, and fixed. When it is seen that any further reduction will render the blacks grey, it is washed and dried. Many a negative otherwise quite useless may in this way be saved:—

Potassium iodide	 30 grs.	6.8 gms.
Water	 10 ozs.	1000 c.c.s.
Iodine	 3 grs.	0.7 gm.

With this bath the whites of the print will assume a dark blue tint, owing to the formation of iodide of starch due to the sizing of the paper; this immediately vanishes upon placing in the hypo solution.

Dis For

"Wellington" S.C.P.

Class Contact Dance

Slow Co	miaci Euper.	
Metol	10 grs.	2.3 gms.
Hydroquinone		6.8 gms.
Sulphite of soda (cryst.)	350 grs.	80 gms.
Carbonate of soda (cryst.)	350 grs.	80 gms.
Bromide of potassium		0.7 gm.
Water	10 ozs.	1000 c.c.s.
solve the above in the order	named.	
very brilliant blue-black to	nes a suitable devel	oper is:—
Sulphite of soda	· 500 grs.	114 gms.
Amidol		11.4 gms.
Bromide of potassium	2 grs.	0·46 gm.

Water This developer keeps only three days; after that time it should be discarded and fresh made up.

.. 10 ozs. 1000 c.c.s.

"Wellington" Lantern Plates.

For Cold Tones.

The single-solution hydroquinone developer given above for Wellington "Ortho-Process" plates is used.

Developer for Warm Black Tones.

Three stock solutions of pyro, ammonia and bromide are prepared as given above for "Speedy" plates. These are used as follows:—Take 30 minims of No. 1, 60 minims of No. 2, and 30 minims of No. 3, with water, 1 oz. This is for warm black tones. Time of development, two minutes.

For warmer tones, increase the exposure four to six times, also increasing No. 3 up to 90 minims. Time of development, five to six

minutes.

"WELLINGTON" S.C.P. LANTERN PLATES.

Developer.

		Tier		
Metol			20 grs.	2.3 gms.
				23 gms.
			800 grs.	91 gms.
				2.3 gms.
				2.3 gms.
Water			20 ozs.	1000 c.c.s.
	Sodium sulphite Sodium carbonate Hydroquinone Potass bromide	Sodium sulphite	Sodium sulphite	Sodium sulphite

Warm Tones.

Increase of the bromide up to 20 grs. per ounce of developer gives very pleasing warm tones.

B. Ammonium carbonate	 1 oz.	10 gms.
Ammonium bromide	 1 oz.	10 gmg.
Water	 10 grs.	100 c.c.s.

For warm brown to sepia tones, take A, 1 oz.; B, 1 drachm. For very warm reddish tones, take A, 1 oz.; B, 2 drachms.

WRATTEN & WAINWRIGHT, LTD.

Wratten Plates.

TEN PER CENT. PYRO AND AMMONIA. ,

A Liquor ammonia 1 oz.

22.	Potass bromide Water		100 grs. 10 ozs.	21 gms. 1000 c.c.s	
В.	Pyro Citric ac.d		1 oz. 60 grs.	100 gms. 12 gms.	
	Or— Sulphuric acid	 	 10 ozs	6 c.c.s.	

For use with "I.D.S." and "Speed" Plates, the bromide in solution A should read—

Potass bromide 110 grs. 22 gms.

For instantaneous and ordinary take from 60 (3 c.c.s.) to 90 minims (5 c.c.s.), and for "I.D.S." and "Speed" plates 90 minims (5 c.c.s.) of solution B, dilute with from 2 to 4 ozs. (60 to 120 c.c.s.) of water, and add 100 minims (6 c.c.s.) of solution A.

It is better to add solution A by instalments as development proceeds, unless the exposure is known to be either insufficient or quite accurate, in which cases it may be in one quantity.

PYRO-SODA.

We recommend this developer for studio and hand camera work.

No. 1.	Sodium sulphite	 	6 ozs.	75 gms.
	Water	 	80 ozs.	1000 c.c.s.
	Sulphuric acid	 	1 dr.	1.5 c.c.
	Pyro	 	1 oz.	13 gms.
No. 2.	Sodium carbonate	 	6 ozs.	75 gms.
	Water	 	80 ozs.	1000 c.c.s.

For use, take equal parts of Nos. 1 and 2.

For denser negatives use the following more concentrated developer:—

No. 3. Sodium sulphi	te		 6 ozs.	100 gms.
Water			60 ozs.	1000 c.c.s.
Sulphuric acid			l dr.	2 c.c.s.
Pyro	• •	• •	 1 oz.	17 gms.

No. 4. Sodium carbonate . . . 6 ozs. 100 gms.

Water 60 ozs. 1000 c.c.s.

Take equal parts of Nos. 3 and 4.

For	" Verichrome,"	"Allochrome,"	" Wratten	Panchromatic,"	and
		" Bathed"	Plates.		

Metol	 	44 grs.	10 gms.
Hydroquinone	 	22 grs.	5 gms.
Sodium sulphite	 	1 oz.	100 gms.
Sodium carbonate	 	1 oz.	100 gms.
Water	 	60 ozs.	6000 c.c.s.

For Process and X Ray Plates.

A.	Hydroquinone	 1 oz.	25 gms.
	Potass metabisulphite	1 oz.	25 gms.
	Potass bromide	 1 oz.	25 gms.
	Water	 40 ozs.	1000 c.c.s.
В.	Caustic potash, pure	 2 ozs.	50 gms.
	Water	 40 ozs.	1000 c.c.s.

Use equal parts of A and B, and develop for three minutes.

Wratten Lantern Plates.

(BROMIDE EMULSION.)

Developer.

- A. Metol-hydroquinone, single solution, given above for "Verichrome" plates.
- Ammonium bromide 100 gms. В. 1 oz. Ammonium carbonate 1 oz. 100 gms. 1000 c.c.s. Water 10 ozs. 1 oz. 100 gms. C. Hypo 10 ozs. 1000 c.c.s. Water

Develop as follows:—Give the exposure and mix the developer according to the colour required.

Measure the time from the pouring on of the developer to the appearance of the image. Multiply that time by 8 and develop for the total time thus found,

Tone.	Drs.	Developer. l oz. contain Drs.		Exposure Multiple.	Develop- ment time (in mins.) at 60° F.
Warm black Cool sepia Warm sepia Sepia brown Brown Brown purple Purple Carmine	7½ A 7 A 6½ A 6½ A 6½ A 6½ A 4½ A	1 B 1 B 1 B 2 B 1 B 2 B 1 B 2 B 3 B	1 C 1 C 1 C 1 C 1 C	2 3 3 6 3 5 10 48	2½ 4 8 10 5 10 12 20

Thiocarbamide Developer.

T.	Thiocarbamide	 66 grs.	7.5 gms.
	Ammonium bromide	 22 grs.	2 5 gms.
	Water	 20 ozs.	1000 c.c.s.

The following table gives the exposure and developing factors for the production of blue tones with thiocarbamide.

Tone.		Devel	oper.			xposure Iultiple.	
Dead black (Neutral)	 	7 A +	B	+	3T	2	
Blue black	 	6 A +		+	1T	4	
Blue	 	$5\frac{1}{2}A +$		+	1/2 T	8	
Violet	 	5 A +	21B	+	1T	16	

The time of development with thiocarbamide depends so greatly on the temperature that visual inspection is necessary. Neither time nor factorial methods are of any use.

CHAS. ZIMMERMANN & CO., LTD.

"Agfa" Plates.

ISOLAR.

Rodinal Developer.

In cases of normal exposure develop with-

Rodinal	 	 	 	1 part
Water	 	 	 	20 parts

In cases of over-exposure with-

	-			
Rodinal		 	 	1 part
Water		 	 	10-20 parts

(adding an ample quantity of solution of potassium bromide, 1: 10), and in case of under-exposure use—

Rodinal	 	 	 1 part
Water	 	 	 20-40 parts

If development has been performed with an alkaline developer, such as rodinal, eikonogen, metol, pyro, etc., the negative will be quite clear after fixing; but should ferrous oxalate or amidol have been used, there will in all probability be a red colouring of the gelatine, in which case, after fixing, give the plate a five minutes' wash and transfer to a bath of soda carb. 10 per cent. for seven minutes, wash again and replace in the acid fixing bath for ten minutes, and then wash as usual.

When being subsequently intensified or reduced the red colour may reappear, especially when mercury intensification is being employed. In such a case immerse the plate in a 10 per cent. soda carb. solution

for 10 minutes, and then wash until the colour has gone (about one hour).

CHROMO PLATES.

Metol-Hydroquinone Developer.

Metol	 	 48 grs.	5 gms.
	 	 72 grs.	7.5 gms.
Soda sulphite	 	 2 ozs.	100 gms.
Potass. carbonate		 192 grs.	20 gms.
Potass. bromide	 	 10 grs.	1 gm.
Water	 	 20 ozs.	1000 c.c.s.

For softer negatives use rodinal, 1 in 20.

"Crossed Swords" P.O.P.

For Carbon Red Tones.

Water	 	19 ozs.	1000 c.c.s.
Borax		41 grs.	5 gms.
Chloride of gold	 	1 gr.	0·12 gm.

Must be made up two hours before use, but does not keep well.

Print to about required colour, not too deeply, wash in three changes of water, immerse in:—water 20 ozs., salt 2 drams, until the print has turned orange yellow. Wash once and then tone. When a very slightly lighter colour than desired is obtained, replace in the salt solution for five minutes, rinse and fix in:—hypo 2 ozs., water 40 ozs., freshly made.

Carbon Purple and Violet Tones.

Water	 	9 ozs.	250 c.c.s.
Hydrochloric acid	 	3 ozs.	85 c.c.s.
Gold chloride	 	3 grs.	0.2 gm.

Print very deeply, wash thoroughly, and tone until desired colour is reached. Wash again and fix in:—hypo 2 ozs., water 40 ozs.

Less acid gives bluish violet. More acid gives red violet—purple.

Toning may be stopped at any stage.

Black Tones.

Wash prints in four changes of water before toning and place in :-

Potass chloroplatinite	15 grs.	1 gm.
Phosphoric acid (P.B. dil.)	5 drs.	18 c.c.s.
Distilled water	35 ozs.	1000 c.c.s.

When the pictures have assumed the desired black tone they are to be fixed in 5 per cent. hypo for ten minutes, and washed for half an hour in running water. These prints must not be washed (before toning) in the same bath as any other paper, and when removed from the final washing water should be blotted off.

Matt-Albumat.

Gold, Platinum, and Gold-Platinum Toning.

Sodium acetate	 	 22 grs.	2.5 gms.
Soda carbonate	 	 4½ grs.	0.5 gm.
Gold chloride	 	1 gr.	0·11 gm.
Water		20 ozs.	1000 c.c.s.

For platinum black tones, tone for about 30 secs. in the above bath, wash well and transfer to the following platinum bath:—

Potass. chloroplatinite		15 grs.	1 gm.
Oxalic acid		150 grs.	9.7 gms.
Hydrochloric acid		84 minims	5 c.c.s.
Water	 	36 ozs.	1000 c.c.s.

in which the prints must be toned until they have quite a mauvish tint by transmitted light. Used alone, after washing, gives range of tones from brown to black. Best used fresh.

For gold-platinum tones, prints are placed in gold bath for one second only, quickly washed and placed in platinum bath.

For warm black tones, after the first washing immerse the prints one by one in the platinum bath.

For red tones, wash very thoroughly after printing, and then place the prints in a solution of—

Common salt	 	 	 	1 oz.
Water	 	 	 	20 ozs.

Wash well, and dip for a few seconds only in the platinum bath, and then fix as instructed.

For brown or sepia tones as above, leave the prints somewhat longer in the platinum bath.

"Agfa" Isolar Lantern Plates.

Rodinal Developer.

Rodinal	 	 * *		1 part
Water	 	 • •	• •	30—40 parts

Fix in an acid fixing bath.

The fixed picture will usually be found to have a slight coloration, which must be removed by the following operation:—Thoroughly rinse the plate after fixing, and immerse in soda carbonate 10 per cent. solution for five minutes. The colour will increase in this bath, but disappear entirely after a further wash and immersion in the acid fixing bath, after which wash as usual and then dry.

MISCELLANEOUS INFORMATION.

List of the Principal Works on Photography.

[The books mentioned below are obtainable by order of all photographic dealers.]

ELEMENTARY AND GENERAL TEXT-BOOKS.

Elementary Photography. By John A. Hodges. 1s.

Ilford Manual of Photography. By C. H. Bothamley, F.C.S. 1s.

Barnet Book of Photography. 1s. 6d.

Early Work in Photography. By W. Ethelbert Henry, C.E. 1s.

Hand-Camera Photography. By Walter Kilbey. 1s.

Photography in a Nutshell. By the Kernel. 1s.

The Figures, Facts and Formulæ of Photography. ("The Photographic Annual.") By H. Snowden Ward. 1s.; cloth, interleaved, 2s.

Photographic Reference Book. By J. McIntosh. 1s. 6d.

The Science and Practice of Photography. By Chapman Jones. 5s. Instruction in Photography. By Sir William Abney. 11th Edition. Revised and enlarged. 7s. 6d.

Dictionary of Photography. By E. J. Wall. 7s. 6d. Photography: Its History, Processes, Apparatus and Materials. By A. Brothers. 21s.

The Book of Photography. By Paul N. Hasluck. 10s. 6d. The Complete Photographer. By R. Child Bayley. 10s. 6d.

Photography in Principle and Practice. By S. E. Bottomley. 3s.6d.

PHOTOGRAPHIC OPTICS AND CHEMISTRY.

Photographic Lenses: How to Choose and How to Use. By John A.

Photographic Lenses. - By Conrad Beck and Herbert Andrews. 1s. The Lens. By Thos. Bolas and George E. Brown. 2s. 6d.

The Optics of Photography and Photographic Lenses. By J. Traill Taylor. 3s. 6d.

System of Applied Optics. By H. Dennis Taylor. 30s. Photographic Optics, a Treatise on. By R. S. Cole. 6s.

Photographic Optics. By Otto Lummer. Translated by Silvanus

Thompson. 6s.

First Book of the Lens. By C. Welborne Piper. 2s. 6d. Telephotography. By T. R. Dallmeyer. 21s.

Elementary Telephotography. By Ernest Marriage. 3s. 6d.

Lens. work for Amateurs. By Henry Orford. 3s. Tables of Conjugate Foci. By J. R. Gotz. 6d.

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The Chemistry of Photography. By R. Meldola. 6s. Investigations on the Photographic Processes. By S. E. Sheppard,

D.Sc., and C. E. Kenneth Mees, D.Sc. 6s. 6d.

ART, PORTRAITURE, HAND-CAMERA WORK, ETC.

Picture-making by Photography. By H. P. Robinson. 2s. 6d. Photography on Tour. 6d.

Practical Landscape Photography. By G. T. Harris. 1s.

The Photographic Studio. A guide to its construction, etc. By T. Bolas. 2s.

The Lighting in Photographic Studios. By P. C. Duchochois. Revised, with additional matter, by W. Ethelbert Henry, C.E. 1s. Magnesium Light Photography. By F. J. Mortimer. 1s. Instantaneous Photography. By Sir William Abney. 1s.

Stereoscope and Stereoscopic Photography. From the French of F.

Drouin. 2s. Photo-micrography. By E. J. Spitta. 12s.

Practical Photo-micrography. By Andrew Pringle. 3s. 6d.

NEGATIVE PROCESSES.

Wet-collodion Photography. By Charles W. Gamble. 1s.

Collodion Emulsion. By H. O. Klein. 5s. The Wet Collodion Process, By Arthur Payne. 3s.

Practical Orthochromatic Photography. By Arthur Payne. 1s. The Photography of Coloured Objects. By C. E. Kenneth Mees

D.Sc. 1s. Negative-making. By Sir William Abney, F.R.S. 1s.

The Watkins' Manual (of exposure and development). By Alfred Watkins. 1s.

Photography by Rule. By J. Sterry. 1s.

Finishing the Negative. Edited by H. Snowden Ward. 1s.

Retouching. By Arthur Whiting. 1s.

Art of Retouching. By J. Hubert. 1s.
Art of Retouching Negatives, and Finishing and Colouring Photographs. By Robert Johnson. 2s.

PRINTING PROCESSES.

Photographic and Photo-mechanical Printing Processes. By W. K.

Art and Practice of Silver Printing. By Sir William Abney and Robinson. 2s. 6d.

Bromide Enlarging and Contact Printing. By S. Herbert Fry. 6d. Toning Bromide Prints. By R. Blake Smith. 1s.

Toning Bromides. By C. W. Somerville. 1s.

Photographic Enlargements: How to Make Them. By Geo. Wheeler. 1s.

ABC Guide to Autotype Permanent Photography. By J. R.

Sawyer, 1s.

Carbon Printing. By E. J. Wall. 1s.

Photo-aquatint, or Gum Bichromate Process. By Alfred Maskel and R. Demachy. 1s.

Platinotype Printing. By A. Horsley Hinton. 1s.

Ferric and Heliographic Processes. By George E. Brown. 2s. Photographic Reproduction Processes. By P. C. Duchochois. A treatise on photographic impressions without silver salts. 2s. 6d. Photo-ceramics. By W. Ethelbert Henry, C.E., and H. Snowden

Ward. 1s. 6d.

The Photographic Picture Postcard. By. E. J. Wall and H. Snowden Ward. 1s.

LANTERNS AND LANTERN SLIDES: CINEMATOGRAPH.

Modern Magic Lanterns. By R. Child Bayley. 1s. The Lantern, and How to Use It. By Goodwin Norton. 1s. Optical Projection. By Lewis Wright. 6s.

The Optical Lantern: for Instruction and Amusement. By

Andrew Pringle. 2s. 6d.

Lantern Slide Making. By Rev. F. C. Lambert. 1s. Living Pictures. By H. V. Hopwood. 2s. 6d. Animated Photography. By Cecil M. Hepworth. 1s.

PHOTO-MECHANICAL PROCESSES, ETC.

Half-tone Process, The. By Julius Verfasser. 5s.

Half-tone Process on the American Basis. By Wm. Cronenberg. 2s. A Treatise on Photogravure in Intaglio. By the Talbot Klic process. By Herbert Denison. 4s. 6d.

Photo-Mechanical Processes. By W. T. Wilkinson. 4s.

Photo-aquatint and Photogravure. By Thomas Huson. 2s. Professional Photography. By C. H. Hewitt. Vol. I., 1s. Vol.

Photography for the Press. By the Editors of The Photographic Monthly. 1s.

Practical Radiography. A handbook of the applications of the X-rays. By A. W. Isenthal and H. Snowden Ward. 6s.

COLOUR PHOTOGRAPHY.

Photography in Colours. By Bolas, Tallent and Senior. 1s. 6d. Three-colour Photography. By Baron von Hübl. Translated by H. O. Klein. 7s. 6d.

Natural-colour Photography. By Dr. E. König. Translated by

E. J. Wall. 2s.

The Copyright (Works of Art) Act (1862).

An Act for Amending the Law relating to Copyright in Works of the Fine Arts, and for Repressing the Commission of Fraud in the Production and Sale of Such Works.

WHEREAS by law, as now established, the authors of paintings, drawings, and photographs have no copyright in such their works, and it is expedient that the law should in that respect be amended: Be it therefore enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

Copyright in Works Hereafter Made or Sold to Vest in the Author for his Life, and for Seven Years after his Death.

1. The author, being a British subject or resident within the dominions of the Crown, of every original painting, drawing, and photograph which shall be or shall have been made either in the British dominions or elsewhere, and which shall not have been sold or disposed of before the commencement of this Act, and his assigns, shall have the sole and exclusive right of copying, engraving, reproducing, and multiplying such painting or drawing, and the design thereof, or such photograph, and the negative thereof, by any means and of any size, for the term of the natural life of such author, and seven years after his death; provided that when any painting or drawing, or the negative of any photograph, shall for the first time after the passing of this Act be sold or disposed of, or shall be made or executed for or on behalf of any other person for a good or a valuable consideration, the person so selling or disposing of or making or executing the same shall not retain the copyright thereof, unless it be expressly reserved to him by agreement in writing, signed, at or before the time of such sale or disposition, by the vendee or assignee of such painting or drawing, or of such negative of a photograph, or by the person for or on whose behalf the same shall be so made or executed; but the copyright shall belong to the vendee or assignee of such painting or drawing, or of such negative of a photograph, or to the person for or on whose behalf the same shall have been made or executed; nor shall the vendee or assignee thereof be entitled to any such copyright, unless, at or before the time of such sale or disposition, an agreement in writing, signed by the person so selling or disposing of the same, or by his agent duly authorised, shall have been made to that

Copyright not to Prevent the Representation of the Same Subjects in Other Works.

2. Nothing herein contained shall prejudice the right of any person to copy or use any work in which there shall be no copyright, or to represent any scene or object, notwithstanding that

there may be copyright in some representation of such scene or object.

Assignments, Licences, etc., to be in Writing.

3. All copyright under this Act shall be deemed personal or moveable estate, and shall be assignable at law, and every assignment thereof, and every licence to use or copy by any means or process the design or work which shall be the subject of such copyright, shall be made by some note or memorandum in writing, to be signed by the proprietor of the copyright, or by his agent appointed for that purpose in writing.

Register of Proprietors of Copyrights in Paintings, Drawings, and Photographs to be kept at Stationers' Hall, as in 5 and 6 Vict., cap. 45.

4. There shall be kept at the Hall of the Stationers' Company by the Officer appointed by the said Company for the purposes of the Act passed in the sixth year of Her present Majesty, intituled An Act to Amend the Law of Copyright, a book or books, entitled "The Register of Proprietors of Copyright in Paintings, Drawings, and Photographs," wherein shall be entered a memorandum of every copyright to which any person shall be entitled under this Act, and also of every subsequent assignment of any such copyright; and such memorandum shall contain a statement of the date of such agreement or assignment, and of the names of the parties thereto, and of the name and place of abode of the person in whom such copyright shall be vested by virtue thereof, and of the name and place of abode of the author of the work in which there shall be such copyright, together with a short description of the nature and subject of such work and in addition thereto, if the person registering shall so desire, a sketch, outline, or photograph of the said work, and no proprietor of any such copyright shall be entitled to the benefit of this Act until such registration, and no action shall be sustainable nor any penalty recoverable in respect of anything done before registration.

Certain Enactments of 5 and 6 Vict., c. 45, to Apply to the Books to be Kept under this Act.

5. The several enactments in the said Act of the sixth year of Her present Majesty contained, with relation to keeping the register book thereby required, and the inspection thereof, the searches therein, and the delivery of certified and stamped copies thereof, the reception of such copies in evidence, the making of false entries in the said book, and the production in evidence of papers falsely purporting to be copies of entries in the said book the application to the Courts and Judges by persons aggrieved by entries in the said book, and the expunging and varying such entries, shall apply to the book or books to be kept by virtue of this Act, and to the entries and assignments of copyright and proprietorship therein under this Act, in such and the same manner as if such enactments were here expressly enacted in relation thereto, save and except that the forms of entry prescribed by the said Act of the sixth year of Her present Majesty

may be varied to meet the circumstances of the case, and that the sum to be demanded by the officer of the said Company of Stationers for making any entry required by this Act shall be one shilling only.

Penalties on Infringement of Copyright.

6. If the author of any painting, drawing, or photograph in which there shall be subsisting copyright, after having sold or disposed of such copyright, or if any other person, not being the proprietor for the time being of copyright in any painting, drawing, or photograph, shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply for sale, hire, exhibition, or distribution, or cause or procure to be repeated, copied, colourably imitated, or otherwise multiplied for sale, hire, exhibition, or distribution, any such work or the design thereof, or, knowing that any such repetition, copy, or other imitation has been unlawfully made, shall import into any part of the United Kingdom, or sell, publish, let to hire, exhibit or distribute, or offer for sale, hire, e-hibition, or distribution, or cause or procure to be imported, sold, published, let to hire, distributed, or offered for sale, hire, exhibition, or distribution, any repetition, copy, or imitation of the said work, or of the design thereof, made without such consent as aforesaid, such person for every such offence shall forfeit to the proprietor of the copyright for the time being a sum not exceeding ten pounds; and all such repetitions, copies, and imitations, made without such consent as aforesaid, and all negatives of photographs made for the purpose of obtaining such copies, shall be forfeited to the proprietor of the copyright.

Penalties on Fraudulent Productions and Sales.

7. No person shall do or cause to be done any or either of the following Acts: that is to say,—

First, no person shall fraudulently sign or otherwise affix, or fraudulently cause to be signed or otherwise affixed to or upon any painting, drawing, or photograph, or the negative thereof,

any name, initials, or monogram:

Secondly, no person shall fraudulently sell, publish, exhibit, or dispose of, or offer for sale, exhibition, or distribution, any painting, drawing, or photograph, or negative of a photograph, having thereon the name, initials, or monogram, of a person who

did not execute or make such work:

Thirdly, no person shall fraudulently utter, dispose, or put off, or cause to be uttered or disposed of, any copy or colourable imitation of any painting, drawing, or photograph, or negative of a photograph, whether there shall be subsisting copyright therein or not, as having been made or executed by the author or maker of the original work from which such copy or imitation shall have been taken.

Fourthly, where the author or maker of any painting, drawing, or photograph, or negative of a photograph, made either before or after the passing of this Act, shall have sold or otherwise

parted with the possession of such work, if any alteration be afterwards made therein by any other person, by addition or otherwise, no person shall be at liberty, during the life of the author or maker of such work, without his consent, to make or knowingly to sell or publish, or offer for sale, such work or any copies of such work so altered as aforesaid, or of any part thereof, as or for the unaltered work of such author or maker.

Penalties.

Every offender under this section shall, upon conviction, forfeit to the person aggrieved a sum not exceeding ten pounds, or not exceeding double the full price, if any, at which all such copies, engravings, imitations, or altered works shall have been sold or offered for sale; and all such copies, engravings, or imitations, or altered works shall be forfeited to the person, or the assigns, or legal representatives of the person whose name, initials, or monogram shall be so fraudulently signed or affixed thereto, or to whom such spurious or altered work shall be so fraudulently or falsely ascribed as aforesaid: Provided always, that the penalties imposed by this section shall not be incurred unless the person whose name, initials, or monogram shall be so fraudulently signed or affixed, or to whom such spurious or altered work shall be so fraudulently or falsely ascribed as aforesaid, shall have been living at or within twenty years next before the time when the offence may have been committed.

Recovery of Pecuniary Penalties.

8. All pecuniary penalties which shall be incurred, and all such unlawful copies, imitations, and all other effects and things as shall have been forfeited by offenders, pursuant to this Act, and pursuant to any Act for the protection of copyright engravings, may be recovered by the person hereinbefore and in any such Act as aforesaid empowered to recover the same respectively, and hereinafter called the complainant or the complainer, as follows:—

In England and Ireland, either by action against the party offending or by summary proceeding before any two Justices having jurisdiction where the party offending resides:

In Scotland, by action before the Court of Session in ordinary form, or by summary action before the Sheriff of the County where the offence may be committed or the offender resides, who, upon proof of the offence or offences, either by confession of the party offending or by the oath or affirmation of one or more credible witnesses, shall convict the offender, and find him liable to the penalty or penalties aforesaid, as also in expenses; and it shall be lawful for the Sheriff, in pronouncing such judgment for the penalty or penalties and costs, to insert in such judgment a warrant, in the event of such penalty or penalties and costs not being paid, to levy and recover the amount of the same by poinding: Provided always, that it shall be lawful to the Sheriff, in the event of his dismissing the action

and assoilzieing the defender, to find the complainer liable in expenses, and any judgment as to be pronounced by the Sheriff in such summary application shall be final and conclusive, and not subject to review by advocation, suspension, reduction, or otherwise.

Superior Courts of Record in which any Action is Pending may Make an Order for an Injunction, Inspection, or Account.

9. In any action in any of Her Majesty's Superior Courts of Record at Westminster and in Dublin, for the infringement of any such copyright as aforesaid, it shall be lawful for the Court in which such action is pending, if the Court be then sitting, or if the Court be not sitting then, for a judge of such Court, on the application of the plaintiff or defendant respectively, to make such order for an injunction, inspection, or account, and to give such direction respecting such action, injunction, inspection, or account, and the proceedings therein respectively, as to such Court or Judge may seem fit.

Importation of Pirated Works Prohibited.—Application in such Cases of Customs Act.

10. All repetitions, copies, or imitations of paintings, drawings, or photographs, wherein or in the design whereof there shall be subsisting copyright under this Act, and all repetitions, copies, and imitations of the design of any such painting or drawing, or of the negative of any such photograph, which, contrary to the provisions of this Act, shall have been made in any Foreign State, or in any part of the British dominions, are hereby absolutely prohibited to be imported into any part of the United Kingdom except by or with the consent of the proprietor of the copyright thereof, or his agent authorised in writing; and if the proprietor of any such copyright, or his agent, shall declare that any goods imported are repetitions, copies, or imitations of any such painting, drawing, or photograph, or of the negative of any such photograph, and so prohibited as aforesaid, then such goods may be detained by the Officers of Her Majesty's Customs

Saving of Right to Bring Action for Damages.

11. If the author of any painting, drawing, or photograph, in which there shall be subsisting copyright, after having sold or otherwise disposed of such copyright, or if any other person, not being the proprietor for the time being of such copyright, shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply, or cause to procure to be repeated, copied, or colourably imitated, or otherwise multiplied for sale, hire, exhibition, or distribution, any such work or the design thereof, or the negative of any such photograph, or shall import or cause to be imported into any part of the United Kingdom, or sell, publish, let to hire, exhibit, or distribute, or offer for sale, hire, exhibition, or distributed, or offered for sale, hire, exhibition, or distributed, or offered for sale, hire, exhibition, or distributed, or offered for sale, hire, exhibition, or distributed.

tribution, any repetition, copy, or imitation of such work, or the design thereof, or the negative of any such photograph, made without such consent as aforesaid, then every such proprietor, in addition to the remedies hereby given for the recovery of any such penalties, and forfeiture of any such things as aforesaid, may recover damages by and in a special action on the case, to be brought against the person so offending, and may in such action recover and enforce the delivery to him of all unlawful repetitions, copies, and imitations, and negatives of photographs, or may recover damages for the retention or conversion thereof: Provided that nothing herein contained, nor any proceeding, conviction, or judgment, for any act hereby forbidden, shall effect any remedy which any person aggrieved by such Act may be entitled to either at law or in equity.

Provisions of 7 and 8 Vict., c. 12, to be Considered as Included in this Act.

12. This Act shall be considered as including the provisions of the Act passed in the Session of Parliament held in the seventh and eighth years of her Present Majesty, intituled An Act to Amend the Law Relating to International Copyright, in the same manner as if such previsions were part of this Act.

REPRODUCTION FEES.

The Copyright Union has drawn attention to the following suggestions, drawn up for the guidance of its members, by Mr. Alfred Ellis:—

Members are advised not to give permission for their copyright photographs to be reproduced until they have full particulars of the size and style of the proposed reproduction, when they can formulate their charges accordingly. For example: a newspaper should pay a fee of not less than 10s. 6d. for half-tone black-and-white reproduction not exceeding 6 by 4 inches, when printed with letterpress in one issue of a newspaper; but, if 't is to be printed as an inset, the fee should be at least one guinea. If printed in colours, collograph, or photogravure, it should be a still higher fee. If a photograph is to be reproduced for advertising purposes, a higher fee should be charged than for newspaper work. In all cases the permission must be in writing, and should state the fee to be paid, the process by which the photograph is to be reproduced, and whether in black-and-white or colours, the size limit, and the purpose for which the reproduction may be used.

The fee for reproduction on postcards should be not less than 10s. 6d. royalty per thousand for half-tone or colletype, and £1 ls. per thousand for bromide or ordinary photographic processes.

TABLES.

WEIGHTS AND MEASURES.

The formulæ in the editorial pages of this Almanac are given, in almost all cases, in both British and metric measures, and in adopting this course we have had the desire to impress upon photographers the simplicity and facility of the latter system. As a rule, the British formulæ are expressed in grains or ounces per 20 ozs. of solution, and the metric formulæ in grammes per 1000 c.c.s. In regard to the total bulk of solution, our formulæ are mostly drawn up on the basis that the total bulk after the solution of the solids is that stated in the formula—20 ozs. or 1000 c.c.s. as a rule.

The question of a 10 per cent. solution is a point in formulæ making and using which has caused endless discussion; but it is really simple enough if it be borne in mind that the ounce avoirdupois contains 437½ grains, while the fluid ounce contains 480 minims. As 10 per cent. solutions, being strong, are usually measured out in minims, the ounce avoirdupois must be dissolved in enough water to make a solution containing 1 grain in 10 minims; that is to say, 4375 minims, or practically 9 ounces, is the proper bulk for the solution of 1 ounce avoirdupois. But if a solution is to be measured out in fluid ounces, then the 10 per cent. solution will be 1 oz. in 10 fluid ozs.

Throughout this work "grains per ounce" are converted into "grammes per litre" by multiplying by 2.3. Ounces per any given number of fluid ounces are converted by taking the same ratio of grammes to 1000 c.c.s.

In reference to the names of chemicals, "sodium carbonate" and "sodium sulphite" are used for the crystallised forms of these substances. If the "dry" or "anbydrous" forms are meant, one or other of these terms is used in qualification.

British Weights and Measures.

1. APOTHECARIES WEIGHT.*

20 Grains = 1 Scruple.

3 Scruples = 1 Drachm = 60 Grains.

8 Drachms = 1 Ounce = 480 Grains.

2. AVOIRDUPOIS WEIGHT.*

4372 Grains = 1 Ounce.

16 Ounces = 1 Pound = 7000 Grains.

 $\frac{1}{4}$ ounce = 109 grains; $\frac{1}{2}$ ounce = 219 grains; $\frac{3}{4}$ ounce = 328 grains.

3. FLUID MEASURE.

60 Minims = 1 Drachm.

8 Drachms = 1 Ounce = 480 Minims.

20 Ounces = 1 Pint = 160 Drachms = 9600 Minims, 2 Pints = 1 Quart = 40 Ounces = 320 Drachms.

2 Pints = 1 Quart = 40 Ounces = 320 Drachms. 4 Quarts = 1 Gallon = 160 Ounces = 1280 Drachms. 1 fluid ounce of water weighs 437½ grains, therefore every minim weighs 0.91 grains.

Metric Weights and Measures.

The unit of weight is the gramme, written "gm."; the subdivisions are the "deci-" (1/10th), "centi-" (1/100th), and "milligramme" (1/1000th); the multiples are the "deka-" (10 gm.) and "hectogramme" (100 gm.), but in practice it is usual to use the term 0·1 or 0·01 and 10 or 100 grammes, and the abbreviation "kilo." for 1000 gms.

The following are the equivalents of Metric Weights and Measures

in terms of Imperial Weights and Measures :-

LINEAR MEASURE.

1 Millimetre (mm.) (1/1000th M.) = 0.03937 inch 1 Centimetre (1/100th M.) . = 0.3937 ,, 1 Metre (M.) . . = { 39.370113 inches 3.280843 feet 1.0936143 yards Kilometre (1000 M.) . . . = 0.62137 mile

SQUARE MEASURE.

WEIGHT. Avoirdupois.

1 Milligramme (1/1000th gm.).. = 0.015 grain 1 Gramme (1 gm.) ... = 15.432 ,,

1 Kilogramme (1000 gm.) $\dots = \begin{cases} 2.2046223 \text{ lbs. or} \\ 35.273957 \text{ ozs.} \end{cases}$

^{*} It is now customary in formulæ to employ the avoirdupols ounce (437½ grains); but in cases where "drachms" are given the apothecaries drachm of "60 grains is taken as the unit.

FLUID MEASURE.

1 Cubic centimetre* (c.c.) (1/1000th litre) = 16.9 minims
1 Litre (1 L.) = 35 ozs. 94 m. = 16894.1 minims

Conversion of Metric into British Measures.

GMS. PER LITRE INTO GRAINS PER 10* OZS.

The following table gives the most convenient means of translating metric formulæ into British measures.

* The figures given in Columns 2, 4, and 6 are a correct translation of the metric proportion when the solution is measured out in ounces and fractions of an ounce. If to be measured in minims, the quantities in Columns 2, 4, and 6 are dissolved in 9 ozs. 2 drs. of water.

1 Gms. Per Litre.	2 Grs. Per 10† ozs.	3 Gms. Per Litre.		Ozs. Grs. O† ozs.	5 Gms. Per Litre.	Grs.	6 Ozs. Grs. 0† ozs.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	4·4 8·8 13·1 17·5 26·2 30·6 35·0 43·8 48·1 52·5 66·6 70·0 74·4 78·8 83·1 87·5 96·2 100·6 105·0 109·4	30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 145 140 145	131 153 175 197 219 241 262 284 306 328 350 371 393 415 437 459 481 503 525 547 569 591 613 634 656	1 22 1 44 1 66 1 88 1 20 1 22 1 43 1 25 1 25 1 37 1 20 1 34 1 35 1 35	4, and 6 drs. who	are dissolv	

^{*} Millilitre and C.C.—Revisions of metric standards have shown that the litre is not exactly 1000 c.c.s., but 999.84 c.c.s. (according to Mendeeleel's calculations from the experimental data). The difference appears sufficiently serious in official circles to warrant the abandonment of the term "cubic centimetre," and the employment of "millilitre" for the true thousandth part; millilitre to be abbreviated to "mil." On grounds of terminology there is some reason for this, but until "millilitre" commences to oust c.c. from current writings we shall continue to use the latter term. As regards error, the difference is absolutely negligible, not more than 4 drops in 35 ozs.

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GRAMMES INTO GRAINS AND OUNCES (AVOIRDUPOIS).

Gms.	Ozs. Grs.	Gms.	Ozs.	Grs.	Gms.	Ozs.	Grs.
0·1 0·2 0·3 0·4 0·5 0·6 0·7 0·8 0·9 1 2 3 4 5 6 6 7 8 9 10 11 12 13 14 15	1.5 3.1 4.6 6.2 7.7 9.1 10.8 12.4 13.9 15.43 30.9 46.3 61.7 77.2 92.6 108.0 14.1 29.5 44.9 4.9 15.8 4.9 15.8 4.9 15.8 15.8 16.9 16.9 16.9 16.9 16.9 16.9 16.9 16.9	16 17 18 19 20 25 30 35 40 45 50 65 70 75 80 85 90 95 100 110 120 125	1 1 1 2 2 2 2 3 3 3 3 3 4 4 4	28·1 43·5 59·0 74·4 89·8 57·0 25 103 71 38 6 83 51 19 94 64 32 0 76 44 11 56 102 70	130 140 150 160 170 175 180 190 200 250 300 350 400 450 550 600 650 700 850 900 1000	41 42 42 43 43 43 43 43 43 43 43 43 43	37 82 118 61 0 76 44 88 24 32 31 41 50 52 61 66 70 72 81 91 95 102 106 11

Note.—In the above table the British equivalents are given in the form most convenient for actual work, viz., in even ounces and quarter ounces, with odd grains over. If calculations need to be made, the following figures giving the equivalents of ounces and quarter-ounces in grains will be found useful:—

oz. = 219 grs. 2 ozs. = 875 grs. 32	\$\frac{1}{2}\$ ozs. = 1,531 grs. \$\frac{1}{2}\$ ozs. = 1,640 grs. \$\frac{1}{2}\$ ozs. = 1.750 grs. \$\frac{1}{2}\$ ozs. = 1,859 grs.	$6\frac{1}{4}$ ozs. = 2,734 grs.
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C.C.S. INTO MINIMS AND OUNCES (FLUID).

C.c.s.	Ozs.	Mins.	C.c.s.	Ozs.	Mins.	C.c.s.	Ozs.	Mins.
1 2 3 4 5		16·9 33·8 50·7 67·6 84·5	6 7 8 9 10	141414	101·4 118·3 15·2 32 49	11 12 13 14 15	14-14-14-14-12	66 83 100 117 13

C.C.S. INTO MINIMS AND OUNCES (FLUID) .- Continued.

C.c.s.	Ozs.	Mins.	C.c.s.	Ozs.	Mins.	C c.s.	Ozs.	Mins.
16 17 18 19 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 110	1111112 22223 3333	30 47 64 81 98 82 27 111 76 40 5 89 54 118 103 67 32 116 81 45 10 58	120 125 130 140 150 170 175 180 200 225 250 300 325 350 375 400 425 450	4 4 4 4 5 5 5 5 6 6 6 6 7 7 8 9 10 11 22 3 4 4 15 15 16 11 12 3 14 15 16 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18	107 72 36 85 14 63 112 76 41 90 20 81 24 86 28 90 33 95 37 100 42 105	500 525 550 575 600 625 650 675 700 725 750 775 800 825 850 875 900 925 950 975	17½ 18¼ 19¼ 20 21 22 23¾ 24½ 24½ 26¼ 27¼ 28 29 30¾ 31½ 32¼ 34¼ 35	47 110 52 114 56 0 61 4 66 8 70 13 75 18 80 22 65 27 90 32 94

Conversion of British into Metric Measures.

GRAINS INTO GRAMMES.

Grs.	Gms.	Grs.	Gms.	Grs.	Gms.
1 2 3 4 5 6 7 8 9 10 11 12 13 14	0·065 0·13 0·194 0·259 0·324 0·389 0·454 0·518 0·583 0·648 0·713 0·775 0·842 0·907	16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	1·037 1·102 1·166 1·232 1·296 1·361 1·426 1·490 1·555 1·620 1·685 1·750 1·814 1·880 1·944	35 40 45 50 55 60 65 70 75 80 85 90 95	2·268 2·592 2·916 3·240 3·564 3·888 4·212 4·536 4·860 5·184 5·508 5·832 6·156 6·480

OUNCES (AVOIRDUPOIS) TO GRAMMES.

Ozs.	Gms.	Ozs.	Gms.	Ozs.	Gms.
1	7·09	4	113·40	13	368·54
1	14·17	5	141·75	14	396·89
1	21·26	6	170·10	15	425·24
2	28·35	7	198·45	16	453·59
2	42·5	8	226·80	17	4×1·94
2	56·70	9	255·15	18	510·29
2	70·87	11	311·8	19	538·64
3	85·05	12	340·19	20	566·99

FLUID OUNCES AND DRACHMS TO C.C.S.

Minims. C.c.s.	Drs.	C.c.s.	Ozs.	C.c.s.	Ozs.	C.c.s.
5 = 3 10 = 6 15 = 9 20 = 1.2 25 = 1.4	1 2 3 4 5 6 7 8	1·78 3·55 7·10 10·65 14·20 17·75 21·30 24·86 28·41	11/2 2/3 4/5 6/7 8/9 10	42·6 56·8 85·2 113·6 142·0 170·5 198·9 227·3 255·7 284·0	11 12 13 14 15 16 17 18 19 20	312·5 341·0 369·3 398·0 426·0 454·5 483·0 511·5 540·0 568·0

CONVERSION RULES.

Grammes per litre into grains per ounce.—Multiply the grammes by 0.44.

C.c.s. per litre into minims per ounce.—Divide the c.c.s. by 2 (more exactly, multiply by 0.48).

Grains per ounce into grammes per litre.—Multiply the grains by 2.3. Thus 50 grs. per oz. = 115 gms. per litre.

Minims per ounce into c.c.s. per litre.—Multiply the minims by 2.

COINS AS WEIGHTS.

Silver coinage, it is useful to note, is minted exactly by weight in proportion to its value, viz., 4364/11 grains for every 5s. Thus the threepenny bit is 21.8 grs.; a sixpence, 43.6; shilling, 87.2; florin, 175.4; half-crown, 218 grs.

Thus the sixpence and threepenny piece are almost exactly onetenth and one-twentieth of the avoirdupois ounce.

Bronze coinage—Three pennies, or five halfpennies, or ten farthings = 1 oz. (avoirdupois).

i.e., the penny = 145.8 grs.; 1 halfpenny, 87.5; and 1 farthing, 43.75 grs.

One sovereign weighs 123.27 grs.; the half-sovereign, 61.63 grs.

½ oz. (avoir.) = one-halfpenny and one threepenny piece.

1 ,, ,, = two halfpennies and a farthing.

1,..., = three pennies (or five halfpennies).

2., ., = six pennies (or ten halfpennies).

4 ,, ,, = twelve pennies (or twenty halfpennies.)

FRENCH COINS AS METRIC WEIGHTS.

Lord Crawford gives the following table :-

PARTS.

Formulæ given, as many are, in "parts" may be made up by writing gms. for the solid and c.c.s. for the fluid "parts," and converting them into the British measures by any of the tables in this section. Thus: Adurol, 10 parts; sodium sulphite, 100 parts; water 1000 parts becomes adurol, 154 grs.; sodium sulphite, 3 ozs. 230 grs.; water, 35 ozs.

INCHES INTO MILLIMETRES.

MILLIMETRES INTO INCHES.

Inches.	Milli- metres.	Inches.	Milli- metres.	Milli- metres.	Inches.	Milli- metres.	Inches.
1 15 28 29 10 7 8 18 18 18 11 16 16 17 16 16 17 16 16 17 16 16 17 17 16 17 17 16 17 17 17 17 17 17 17 17 17 17 17 17 17	25·4 23·8 23· 22·2 20·6 19·1 17·5 15·9 14·3 12·7 11·1	58 13123 16 992 3777 38 16 18 302 116 118	9·5 8·7 7·9 7·1 6·4 5·6 4·8 3·2 2·4 1·6 0·8	0·1 0·5 1 2 3 4 5 6 7 8 9 10 11	0.0039 0.015 0.04 0.08 0.12 0.16 0.20 0.24 0.28 0.31 0.53 0.39 0.43	13 14 15 16 17 18 19 20 21 22 23 24 25 25·4	0·51 0·55 0·59 0·63 0·67 0·71 0·75 0·79 0·83 0·87 0·90 0·94 0·98 1·0

ENGLISH SIZES OF PLATES.

Inches.	Cm.	Inches.	Cm.	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	8·9 × 6·4 8·25 × 8·25 10·8 × 8·25 12·6 × 10·1 16·5 × 12·0	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} 17.8 \times 12.7 \\ 21.5 \times 16.5 \\ 25.4 \times 20.3 \\ 30.4 \times 25.4 \\ 38.1 \times 30.4 \end{array}$	

¹ Lantern plate. ⁹ Quarter-plate. ⁸ Smallest common size in America. ⁴ Half-plate. ⁵ Usual medium size in America. ⁶ Whole-plate.

CONTINENTAL SIZES OF PLATES IN COMMON USE.

Cm.	Inches.	Cm.	Inches.	
9 × 12*	3·54 × 4·72	18 × 24	7 08 × 9·44	
12 × 16	4·72 × 6·30	24 × 30	9·44 × 11·81	
13 × 18†	5·12 × 7·08	30 × 40	11·81 × 15·75	
13 × 21	5·12 × 8·25	40 × 50	15·75 × 19·69	

^{*} The standard small size, equivalent to the British quarter-plate.

FOREIGN LANTERN SLIDES.

The standard French size for lantern slides is 10 by 8 cm., though many makers prepare slides $3\frac{1}{4}$ by $3\frac{1}{4}$. The American size is 4 by $3\frac{1}{4}$, though some makers use the English quarter-plate $(4\frac{1}{4}$ by $3\frac{1}{4})$.

[†] The standard medium size (British half-plate).

CHEMICAL TABLES.

TABLE OF SYMBOLS AND EQUIVALENT WEIGHTS OF THE MORE IMPORTANT COMPOUNDS USED IN PHOTOGRAPHY.

The atomic weights of the elements employed in working out the equivalent weights given below are the round numbers contained in the first column of the Table of Atomic Weights on page 382.

NAME.		Sумвоц.	Equiv. Weight
Acid, ac ,, be ,, ca ,, ch ,, ci ,, di ,, fo ,, ga ,, hy ,, lac ,, ni ,, ox , pe ,, pp ,, pi ,, pi ,, su ,, su ,, tai ,, tai	sulphite etic nzoic oric rbolic lorochromic troic tric thionic tric thionic tric thionic tric thionic droploric droploric droploric tric tric tric tric tric tric tric t	SYMBOL. C ₃ H ₆ O C ₈ H ₆ OH SO ₈ Na C ₂ H ₄ O ₂ C ₆ H ₅ COOH H ₃ BO ₃ C ₆ H ₆ OH Cl Or O ₂ OH Cr O ₈ C ₆ H ₈ O ₇ H ₂ O H ₂ S ₂ O ₆ H ₂ CO ₂ C ₆ H ₂ (OH) ₈ COOH HF CH ₈ CH Cl HF CH ₈ CH (OH) COOH HNO ₃ H ₂ S ₂ O ₆ H Cr O ₄ C ₆ H ₂ (NO ₂) ₈ OH C ₆ H ₃ (OH) C ₇ O ₈ C ₆ H ₄ (OH) COOH HNO ₃ C ₆ H ₄ (OH) COOH HNO ₄ C ₆ H ₂ (OO) C ₆ H ₃ (OH) C ₆ H ₃ (OH) C ₆ H ₄ (OH) C ₇ C ₈ H ₄ (OH) C ₈ H ₄ (OH) C ₉ C ₉	WEIGHT 58 162 60 122 62 94 136-5 100 162 46 188 81 36-5 34 90 63 126 139 139 139 126 138 139 139 126 138 139 126 138 139 126 138 139 126 138 139 126 138 139 126 138 126 138 126 138 126 138 126 138 126 138 126 138 126 138 139 126 138 126 138 139 126 138 139 126 138 139 126 138 139 126 138 139 126 138 139 126 138 139
	(methyl) (ethyl)	$CH_8 OH$	

^{*} Adurol is mono-chlor (or mono-brom) hydroquinone.

TABLES OF SYMBOLS, ETC.—CONTINUED.

TABLES OF SYMBOLS, ETC.—CONTINUED.						
NAME.	Symbol. Equiv.					
	WEIGHT.					
Alum, ammonia	Al ₂ (NH ₄) ₂ (SO ₄) ₄ 24H ₂ O 906					
,, chrome	$Cr_2 K_2 (SO_4)_4 24 H_2O \dots 998$					
,, iron ammonia	$Fe_2 (NH_4)_2 (SO_4)_4 24H_2O 964$					
,, potash	Al ₂ K ₂ (8O ₄) ₄ 24H ₂ O 948					
Aluminium chloride	Al ₂ Cl ₆ 12H ₂ O 267					
,, sulphate	Al ₂ (SO ₄) ₈ 16H ₂ O 634					
sulphocyanide	Al ₂ (UNS) ₆ 402					
Amidol	C ₆ H ₈ OH NH ₂ HCl 144.5					
Ammonium bichromate	NH ₃ 17					
humaida	$(NH_4)_2 Cr_2 O_7$					
,, bromide						
,, carbonate,	NH ₄ HCO ₈ + NH ₂ COOH NH ₄ — NH ₄ Cl					
" chloride	(NH ₄) ₂ Cr O ₄					
oitmete	$(NH_4)_2 C_6 H_6 O_7 \dots 226$					
indida	NH ₄ I					
molyhdata	(NH ₄) ₆ Mo ₇ O ₂₄ 4H ₂ O 1236					
nituata	NH ₄ NO ₈ 80					
omalata	$(NH_4)_3 C_2O_4 H_2O$					
,, persulphate	$(NH_4)_2 S_2 O_8 \dots 228$					
phosphate	(NH ₄) ₂ HPO ₄ 132					
", sulphate	(NH ₄) ₂ SO ₄ 132					
,, sulphide	NH4 HS 51					
" sulphocyanide	NH ₄ CNS 76					
,, vanadate	NH ₄ VO ₈ 117					
Amyl, acetate	$C_7 \stackrel{.}{H}_{14} O_2 \dots 130$					
, alcohol	(CH ₈) ₂ CH CH ₂ CH ₂ OH 88					
Aniline	C ₆ H ₅ NH ₂ 93					
"Anthion" (potass. persulphate)						
Antimony, sulphide	Sb ₂ S ₈ 336					
Aurantia	$(C_6H_2(NO_2)_8)_2 N NH_4 \dots 456$					
Aurine	$C (C_6 H_4 OH)_2 C_6 H_4 O \dots 290$					
Barium, bromide	Ba Br ₂ 2H ₂ O					
,, chloride	Ba Cl ₂ 2H ₂ O 244					
,, iodide	Ba I ₂ 391					
" nitrate	Ba (NO ₈) ₂					
,, peroxide	BaO ₂					
, sulphate	Ba SO ₄ 233					
Benzole (benzene)	$C_6 H_6 \dots 78$					
Borax (see Sodium borate)	D., 00					
Bromine	Br 80 Cd Br ₂ 4H ₂ O 344					
Cadmium, bromide	4					
,, chloride						
., iodide	Cd I ₂					
Calcium, carbide	Ca C ₂					
,, carbonate	C ₃ Cl ₂ 6H ₂ O					
" chloride (cryst.)	U3 U12 U112U 213					

MADER OF SVAROLS to

TUDDE OF OTHER	LS, &c.—Continued.	
Name.	SYMBOL.	Equiv. Weight.
Calcium, chloride (fused) ,, hypochlorite ,, sulphate ,, hydroxide (slaked lime). Carbon, bisulphide Celloidin Ceric, sulphate Chloral hydrate Chloroform Chrysoidine Cobalt, chloride Copper, bromide ,, chloride ,, nitrate ,, sulphate	Ca Cl ₂ Ca (O Cl) ₂ Ca SO ₄ 2H ₂ O Ca (O H) ₂ C S ₂ C ₁₂ H ₁₆ O ₆ (NO ₃) ₄ Ce (SO ₄) ₂ 4H ₂ O C Cl ₃ CH (O H) ₂ C H Cl ₃ C ₆ H ₅ N ₂ C ₆ H ₃ (N H ₂) ₂ CO Cl ₂ 6H ₂ O Cu Br ₂ Cu (NO ₃) ₂ 6H ₂ O Cu (NO ₃) ₂ 6H ₂ O Cu SO ₄ 5H ₂ O Cu SO ₄ 5H ₂ O	153 172 74 76 504 404 165·5 211·7 238 223·5 170·5 357·5
Cyanine Dextrine Diamidophenol Edinol* Eikonogen† Eosine Erythrosine	Cu SO ₄ SH ₂ O C ₃₉ H ₉₅ N ₂ I (C ₆ H ₁₀ O ₅) x C ₆ H ₈ OH (NH ₂) ₂ C ₁₀ H ₅ (OH) NH ₂ SO ₂ O Na or K Salt of C ₆ H ₄ (CO) ₂ O (C ₆ H OH X‡ C ₆ H ₄ (CO) ₂ O (C ₆ H X ₂ ‡) ₂ C ₄ H ₁₀ O	544 124 Na 263 — OH
Ferrous and ferric salts (See Iron) Formaline Glycerine Glycin§ Gold, chloride yellow ,, ,, brown ,, ,, potassium ,, ,, sodium Hydrogen, peroxide Hydroquinone Iodine Iridious chloride ,, tetrachloriJe ,, potassium ,, sodium ,, sodium ,, sodium ,, sodium ,, sodium ,, sodium ,, reconstruction of the service	40 % sol. of CH ₂ O C ₈ H ₅ (OH) ₈ C ₆ H ₄ OH NHCH ₂ COO! H Au Cl ₄ ⁴ H ₂ O H Au Cl ₄ 2H ₂ O Ns Au Cl ₄ 2H ₂ O H ₂ O ₂ C ₆ H ₄ (OH) ₂ Ir Cl ₃ Ir Cl ₄ K ₂ Ir Cl Cl ₆ Ns ₂ Ir Cl ₆ .	92 H. 167 412 340 414 398 34 110 127 299 5 335 484
Ferric chloride (dry)		325

^{*} Edinol is the hydrochloride of γ-amido-oxy-benzyl-alcohol.

[†] Eikonogen is the sodium salt of amido- β -naphthol- β -monosulphuric acid. ‡ The X in these formulæ may be bromine, iodine, or chlorine, which element in other proportions constitute the various commercial dyes.

[§] Glycin is γ-oxyphenyl-glycin or γ-oxyphenyl-amido-acetic acid.

TABLES OF SYMBOLS, &c .- CONTINUED.

THE STATE	Equiv.
NAME.	SYMBOL. WEIGHT
Ferric chloride (lump)	Fe ₂ Cl ₆ 12H ₂ O 541
", ammonia citrate, brown	4 Fe C ₆ H ₅ O ₇ 3 (NH ₄) ₈
	$C_6H_5O_7$ 3 Fe $(OH)_32030$
,, ,, green	5 Fe C ₆ H ₅ O ₇ 2(NH ₄) ₈ C ₆ H ₅ O ₇
oroloto	$NH_4C_6H_7O_7$ $2H_2O$ 1956 Fe ₉ (C ₉ O ₄) ₈ 376
,, oxalate	Fe ₂ (C ₂ O ₄) ₃
,, potassium ,,	K_3 Fe $(C_2 O_4)_8$ $3H_2O$ 491
,, sodium ,,	$Na_6 \text{ Fe } (C_2O_4)_6 11H_2O 976$
Ferrous, chloride (dry)	Fe Cl ₂
" ,, (cryst.)	Fe Cl ₂ 4H ₂ O 199
,, oxalate	Fe $C_2 O_4 2H_2O_2 180$
,, potassium oxalate	$K_2 \text{ Fe } (C_2 O_4)_2 H_2 O \dots 328$
,, sulphate	Fe SO ₄ 7H ₄ O 278
" ammonia sulphate Lead, acetate	Fe $(NH_4)_2$ $(SO_4)_2$ $6H_2O$ 392 Pb $(C_2 H_3 O_2)_2$ $3H_2O$ 379
, nitrate	Pb $(NO_8)_2$
Lithia, caustic	Li OH 24
Lithium, bromide	Li Br 87
,, carbonate	Li ₂ CO ₈ 74
Lithium, chloride	Li Cl (cryst. has $2H_2O$) 42.5
,, iodide	Li I 134
Magnesium, chloride	Mg Cl ₂ 95
Manganese, peroxide	$ \text{Mg SO}_4 7 \text{H}_2 \text{O} \dots 246 \\ \text{Mn O}_2 \dots 87 $
,, sulphate	$\operatorname{Mn} \operatorname{SO}_4 \operatorname{4H}_2 \operatorname{O} \ldots 225$
Mercury	Hg 200
,, bichloride	Hg Cl ₂ 271
,, iodide	Hg I ₂ 454
,, potass. iodide (sol.)	HgI ₂ ·2KI 786
Metol*	$(C_6H_4OH NHOH_8p)_2 H_2SO_4 344$
Ortol†	$(C_6H_4OH NHCH_8p) + C_6H_4$
Palladious chloride	$(OH)_2 p$
, potassium chloride	K_2 Pd Cl_4 326
Para-amidophenol	C ₆ H ₄ NH ₂ OH 109
Phenol (see Acid carbolic)	
Platinum per (or bi)chloride	H ₂ Pt Cl ₆ 6H ₂ O 516.4
Potassium, ammonium chromate	K NH ₄ Cr O ₄ 173
" bicarbonate	K H CO ₈ 100
" bichromate	$K_2 \operatorname{Cr}_2 \operatorname{O}_7 \ldots 294$
,, boro-tartrate	$C_2 H_2 (OH)_2 (OO_2)_2 BOK 214$ K Br 119
,, bromide	
,, carbonate (dry)	122 008 138

^{*} Metol is the sulphate of mono-methyl-para-amido-phenol. † Ortol is a mixture of one molecule each of methyl-ortho-amido-phenol and hydroquinone.

TABLES OF SYMBOLS, &c.-Continued.

- 1 - Tribe Pallager College	NAME.	SYMBOL.	Equiv. Weight.
Potassium	chlorate	KOLO	122-5
		K Cl O ₈	
2.0			
21	chloro-platinite		
"	citrate	$K_2 \operatorname{Cr} O_4 \ldots K_8 C_6 \operatorname{H}_5 O_7 \operatorname{H}_2 O \ldots$	
,,			
17	ferricyanide	KCN	
11		K ₈ Fe (CN) ₆	422
,	ferrocyanide	K4 Fe (CN)6 3H20	56
77	hydrate	K HO	
5.9	iodide	KI	
27	metabisulphite	$K_2 S_2 O_5 \dots$	
,,	nitrate	K NO ₈	
27	nitrite	K NO ₂	85
29	oxalate	$K_2 C_2 O_4 H_2 O \dots$	
22	percarbonate	$K_2 C_2 O_6 \dots$	
11	perchlorate	K Cl O ₄	
11	permanganate	K ₂ Mn ₂ O ₈	
23	persulphate	$K_2 S_2 O_8 \dots$	
, 11	sulphate	K_2SO_4	
73 11 1 .	sulphocyanide	KCNS	
Pyrocatechi		$C_6 H_4 (OH)_2 \dots$	
	.t	K Na C_4 H_4 O_6 $4H_2O$	282
	alt (sodium sulphanti-	37 61 6 677 6	450
	,	Na ₈ Sb S ₄ 9H ₂ O	
	ite	$Ag C_2 H_8 O_2 \dots$	
//	onium nitrate	$Ag NO_8 + 2NH_8 \dots$	
,, brom		Ag Br	
	nate	Ag ₂ CO ₈	
,, chlor		Ag Cl	
,, citrai		$Ag C_6 H_5 O_7$	
	de	Ag F 4H ₂ O	
	θ	Ag I	
,, nitra		Ag NO ₈	
,, nitrit		Ag NO ₂	
,,	ite	$Ag_2 C_2 O_4 \dots$	
		Ag ₂ O	
	phate	Ag ₈ PO ₄	
	ate	Ag ₂ SO ₄	
	ide	Ag ₂ S	
~ ~ .	ate	$Ag_2 C_4 H_4 O_6 \dots$	
Sodium, ace	tate	Na C_2 H_8 O_2 $3H_2O$	
11 33		Na C_2 H_3 O_2	
	rbonate	Na H CO ₈	
,,	aromate	Na ₂ Cr ₂ O ₇ 2H ₂ O	
" bisu	llphite	Na H SO ₈	104

TABLES OF SYMBOLS, &c .- CONTINUED.

	Name.		EQUIV. VEIGHT
3. 3.	1		
	borate	Na ₂ B ₄ O ₇ 10H ₂ O Na Br 2H ₂ O	
>>	bromide		
9.9	carbonate (dry)	Na ₂ CO ₃	
. 19	carbonate (cryst.)	Na Cl	
12	chloride	Na ₂ Pt Cl ₆ ôH ₂ O	560.4
21	chloro-platinate	Na ₈ C ₆ H ₅ O ₇ 5 H ₂ O	357
27	citrate	Na F	42
11	fluoride	Na OH	
,,		Na H SO ₂	
11	hydrosulphite*	Na ₉ S ₂ O ₃ 5H ₂ O	
31	hyposulphite†iodide	Na I	
11	nitrate	Na NOs	
5.5	nitro-prusside	Na ₄ Fe ₂ (CN) ₁₀ (NO) ₂ 4H ₂	
11		Na ₂ C ₂ O ₄	134
9.9	phosphate	Na ₂ HPO ₄ 12H ₂ O	
19		Na ₈ PO ₄ 12H ₂ O	
2.2	tribasic phosphate	Ne ₂ SO ₄ ·10H ₂ O	
51	sulphate (cryst.)	Na ₂ S 9H ₂ O	
39	sulphide sulphite (dry)	Na ₂ SO ₈	
39		Na ₂ SO ₈ 7H ₂ O	252
99	tungstate	Na ₁₀ W ₁₂ O ₄₁ 28H ₂ O	379.8
Strontin	am, bromide	Sr Br ₂	247.
	chloride (dry)	Sr C' ₂	
***	,, (cryst.)	Sr Cl ₂ 2H ₂ O	194
22	iodide	Sr I ₂	
21	nitrate	Sr (NO ₈) ₂	
Thioger	bamide	$CS(NH_2)_2$	
	amine	CS (NH ₂) NH C ₈ H ₅	
	amine	CH ₈ C ₆ H ₈ OH C ₈ H ₇	
	annous) chloride	$\operatorname{Sn} \operatorname{Cl}_2 + 2\operatorname{H}_2\operatorname{O} \dots$	
	n, acetate	$UO_{2} (C_{2} H_{3} O_{2})_{2} 2H_{2}O$	
	chloride	UO ₂ (C ₂ H ₃ O ₂) ₂ 2H ₂ O	
33	nitrate	UO ₂ (NO ₈) ₂ 6H ₂ O	
	ilphate	Zn SO ₄ 7H ₂ O	
eriic, st	привос	ZH DO4 (1130	201

^{*} Called "hyposulphite" by chemists. † Called "thiosulphate" by chemists.

TABLE OF THE SOLUBILITIES OF THE PRINCIPAL SUBSTANCES USED IN PHOTOGRAPHY.

sol.=soluble; v.s.=very soluble; s.s.=slightly soluble; dec.=decomposed; insol.=insoluble.

Name.		t is solu- parts ater.	100 parts of water dissolve at ordinary temperature.	Solubility in Alcohol, &c.
Acetone ,, sulphite Acid, acetic ,, benzoic ,, borie ,, carbolic ,, chromic (anhydride) ,, citric ,, formic ,, gallic	v.s. 380 29 15 0.6 3 100	45 2·9 ·· v.s.	0·27 31 6·6 160 130	s.s. 1 in 2.75 90% 1 in 28 90% v.s. sol. with decomp'. 1 in 5 90% alcohol 1 in 40 ether

Acetone.—(Sp. gr. 0.814), boils at 133°F. miscible in all proportions with water, according and ether. 272 gms. dissolve in 100 gms. 20% cane sugar solution at 60°F. A solvent of resin, fats, camphor, pyroxylin and celluloid.

Acetic Acid.—The "glacial" acid, which is that implied in formulæ unless a weaker acid is directed, solidifies about 50°. Its sp. gr. is 1.055; it boils at 245°F. It is a solvent of gelatine, celluloid, pyroxyline, fats, oils, etc., blisters the skin, strongly absorbs water from the air, and is miscible with water, alcohol, ether, chloroform and glycerine in all proportions.

Formic Acid.—A colourless liquid of 1°22 sp. gr. (=100% acid), miscible with water and alcohol. Weaker solutions are :—1°20 (90%); 1°18 (80%); 1°15 (65%); 1°12 (50%) and 1°06 (25%).

Hydriodic Acid.—A solution of the gas, HI, and obtainable as strong as sp. gr. 2.0 (=96% HI). Solution of sp. gr. 1.7 contains about 52%; sp. gr. 1.5, about 43%.

Hydrobromic Acid.—A solution of the gas, HBr., in water. The strongest solution has sp. gr. of 1°78 (=82%); sol. of 1°495 sp. gr. contains 48% HBr.; 1°38, 40%; 1°208, 25%.

Hydrochloric Acid.—A solution of the gas, HCl, in water. The commercial strongest acid has sp. gr. 1'16, and contains about 30% HCl. Impure acid is sold as "spirits of salte."

Hydrocyanic Acid (=Prussic Acid),—The strength of the official acid of the British Pharmacopeia is 2%. A 10% acid is obtainable in the chemical trade. Both are the most deadly and dangerous poisons.

Hydrofluoric Acid is a strongly fuming solution of the gas HF.; it is sold of strengths 40% and 55% HF.

Lactic Actd is sold as a colourless syrupy liquid, miscible with water or alcohol. Sp. gr. 1.21. A weaker acid is also sold commercially containing 50% acid.

TABLE OF THE SOLUBILITIES, &c.-CONTINUED.

Name.	One part is solu- ble in — parts of water.		100 parts of water dissolve at ordinary temperature.	Solubility in Alcohol,
	Cold.	Boiling	water at o	
Acid oxalic	9.5	0.3	101	
" pierie	100	••	i	1 in 10 90%, also in ether
" pyrogallic	21/4	v.s.	44	sol. also in ether, not in chloroform
" salicylic	500	$12\frac{1}{2}$	1/5	1 in 35, 1 in 2 in ether
" tannie	0.5	• •	20	1 in 0.6, nearly insol.
,, tartaric	34	1/3	132	
Agar-agar			• •	
Alum, ammonia	8.3	0·24 dec.	12 16	insoluble
,, iron ammonia	3 10	dec.	33 9·6	insoluble
Aluminium, chloride	34	v.s. 1·1	400 35	soluble

Nitric Acid.—Strongly corrosive liquid of 1.42 sp. gr. (=71% HNO₃); soluble in water; oxidises alcohol and other organic solvents,

Phosphoric Acid.—Sold as syrupy liquid, that of 1.75 sp. gr. (=about 90% acid), being intended when "phosphoric acid" is prescribed in formulæ,

Sulphuric Acid.—The commercial strong acid is a thick corrosive liquid of 1.84 sp. gr. (=98% H₂SO₄). It absorbs water rapidly from the air, and, mixed with water, great heat is developed. The acid should always be added to water—not vice versa.

Sulphurous Acid.—Solution in water of the gas SO_2 ; saturated solution of 1.046 is equivalent to 9.5% H_2SO_3 , but soon loses strength.

Albumen.—On heating the cold solution to 160%F, the albumen separates in insoluble form, Alcohol similarly coagulates albumen.

Methyl Alcohol (sp. gr. 0.814).—The chief constituent of crude "wood spirit," or wood naphtha, in which is usually 10% of acetone.

Ethyl Alcohol forms "absolute alcohol" (sp. gr.0.830 to 0.834), which contains from 2 to 5% water. Alcohol containing 16% water is "rectified spirit." "Methylated" spirit consists of rectified spirit plus 10% crude wood spirit and $\frac{1}{6}$ % mineral naphtha, the latter precipitating as a milkiness on addition of water. These various forms of alcohol mix with water, which can be abstracted with dry potassium carbonate.

Aluminium Chloride. -100 gms. saturated solution (sp. gr., 1.35) contains 41.1 gms. aluminium chloride.

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TABLES OF THE SOLUBILITIES, &c .- CONTINUED.

THEE DESIGNATION OF THE PROPERTY OF THE PROPER			,	
Name.	One part is solu- ble in — parts of water.		100 parts of water dissolve at ordinary temper ture.	Solubility in Alcohol,
	Cold.	Boiling.	100 wate at tem	
Aluminium, sulphocyanide	4	V.S.	24	less sol, in alc. & eth.
Amidol	5	1	20	1 in 31 absolute alc.
hammida	1.4	V.S.	72	I III of absolute alc.
nombanata	4	dec.	25	
,, chloride	3	1.4	35	
,, citrate	1	V.S.	200	
,, iodide	0.6	V.S.	165	lin 4 alc., s.s. in ether
" molybdate	21	dec.	40	
" nitrate	1 2	V.S.	200	
" oxalate	23	2.4	4.3	sol.
,, persulphate	11/2	dec.	65	
" (hydro) sulphide	0.0		7.00	
" sulphocyanide	0 6	V.S.	160	.V.S.
", vanadate	S.S.	V.S.	• •	
Amyl, acetate	• •		• •	
Aniline		• •	• •	
Antimony sulphide	insol.	• •	• •	
Aurantia	8.8.		• •	v.s.; s.s. in ether
Aurine	8 S.			sol.; also in ether
Barium bromide	0.75	0.5	133	v.s. in benzole
" chloride	2.4	1.3	42	insol.
" iodide	1	v.s.	200	1 in 20 alcohol
,, nitrate	12	3.1	8	insol.
Bromine	31		3.2	
Cadmium, bromide	0.94	V.S.	106	lin 3alc; lin 250 eth.
,, ammonium bromide	0.7	V.S.	137	
" chloride	0.71	0.67	140	1 in 8 alcohol
,, iodide	1.08	0.75	93	linlale.; lin36eth.
Calcium, chloride (cryst.)	7 4	V.S.	400	
" (fused)	1.4	0.65	70	
" sulphate	380	450	0.3	
,, hydroxide	700	1.300	0.137	
Ceric sulphate		200	8·3 400	1 in 1/5 000/ 1 in 50
Chloral hydrate	4		400	1 in 1/5 90%, 1 in 50 carbon bi-ult hide.
				carbon bi-iii fide.

Aluminium Sulphocyani le is purchased as a reddish solution of 1.16 sp. gr. Ammonium Sulphide is sold as a deep yellow solution containing also polysulphides.

Amyl Acetate.—Liquid of sp. gr. 0.876, miscible with alcohol and ether, but not with water. A solvent of fats, oils, resin, pyroxyline and celluloid.

Amyl Alcohol, the chief constituent of fusel oil, is not miscible with water.

Aniline (sp. gr. 1.036) is freely miscible with alcohol or ether, but only very slightly with water. It boils at 356° F. and coagulates albumen.

TABLES OF THE SOLUBILITIES, &c .- CONTINUED.

Name.	One part is soluble in — parts of water. Cold. Boiling.		100 parts of water dissolve at ordinary temperature.	Solubility in Alcohol,
Copper bromide. ,, chloride. ,, sulphate. Cyanine Diamidophenol Edinol Eikonogen Eosine Ether Erythrosine Glycerine. Glycerine. Glycin Gold, chloride. Hydroquinone Iodine IRON Ferric chloride (lump) ,, (dry) ,, ammonium citrate (brown)* ,, (green)† ,, oxalate ,, ammonium oxalate , potassium ,, sodium ,, Ferrous chloride (dry) ,, cryst.) ,, oxalate ,, potass. oxalate ,, sulphate ,, am. sulphate Lead, acetate Lead, nitrate	v.s. 0·83 2½ s.s. sol. 25 sol. 12 s.s. v.s. 17 insol. v.s. 0·63 4 15 1·69 2 0·68 4500 1·43 3 1½ 2	v.s. v.s. insol. v.s. v.s. 0.85 0.55 v.s. v.s. 0.27 0.7	121 40 4.2 8 6 160 25 0.48 6.6 60 50 147 70 33 666 50	v.s.; also in ether. [cohol or ether. nearly insol. in alinsol. in ether. s.s. sol.; also in carbon bisulphide insol. 1 in 15 alcohol; insol. in ether.

Ether (called also "sulphuric ether") is very volatile and inflammable. Boils at 95° F., sp. gr. 0.722.

Formaline. - A commercial strong solution (40%) of formic aldehyde, CH2O. Gelatine.—A commercial strong solution (40%) of formic aldehyde, CH₂U. Gelatine becomes swollen in cold water and dissolves in hot. Dissolved in the cold by oxa ic, acetic, hydrochloric, and nitric acids, barium chloride and chloral hydrate. Precipitated from its solution in water by alcohol. Glycerine.—Miscible with water or alcohol. Sp. gr. 1'255.

Iod me di-solves freely also in carbon bisulphide or potassium iodide solution. Ferric Oxalate is very soluble; over 20%, it is partially reduced to ferrous oxalate on heating the solution to 212° F.

Seven parts of ferrous sulphate correspond to 10 parts ferrous ammonium * 21.7.22.4% iron, sulphate. + 14 to 15% iron.

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TABLES OF THE SOLUBILITIES, &c.-Continued.

Name.	One part is solu- ble in — parts of water.		100 parts of water dissolve at ordinary temperature.	Solubility in Alcohol,	
	Cold.	Boiling	water at o		
Lithia, caustic	8.8.	0.4			
Lithium, bromide	0.7	0.4	143		
" carbonate	72	138	1.3	V.S.	
" chloride iodide	0.61	0.2	164	** 0	
Magnesium, chloride (dry)	1.7	11	60	V.S	
amluhata	i	0.15	100	V.S.	
Manganese, sulphate	0.8	1	120		
Mercury, bichloride	16	1.8	6.3	insol. in absolute alc.	
" iodide	150		0.66	1 in 4.90%	
Metol	sol.			2 111 1 00 /0	
Ortol	sol.			s.s.; also in ether	
Para-amido-phenol	10		10		
Phenol (see acid carbolic)				1 in 22	
Potassium, bicarbonate	4	dec.	25		
" bichromate	10	1	10		
" borotartrate	34	V.8.	135		
" bromide	11	1	65		
,, carbonate(dry)		0.64	112	1 in 750	
" chlorate	17	2	6	insol.	
" chloride	3	1.75	33	insol.	
,, chloroplatinite		V.S.	17		
" chromate	2	1.2	50	insol	
" citrate	0.6	V.S.	166	insol.	
" cyanide	0.8	V.S.	122	V.S.	
" ferricyanide	21/2	1.3	40	1 in 9	
" ferrocyanide	1 4	2	29	lineal cineal in ath	
" hydrate iodide	0.7	V.S.	140	insol.; insol. in eth.	
mata himly hite		dec.		1 in 16, 90%	
nitrata	31	0.4	28	1 11 10, 50 70	
nituita	1	V.S.	100		
oxalate	3	V.S.	33	insol.	
noveemboneto	15	dec.	6.5	IIISOI.	
perchlorate	100	5	1		
,, permanganate			6.25		
" persulphate	1	dec.	2		
" sulphocyanide		V.S.	220	insol. in absolute alc.	
" acid sulphate	2	0.8	50		
Pyrocatechin	14	V.S.	80		
Rochelle salt	11/2	V.S.	66		
Schlippe's salt	3	V.S.	33		
	1				

TABLE OF THE SOLUBILITIES, &c.-CONTINUED.

TABLE OF THE SOLIDBILITIES, &c.—CONTROLD.						
Name.	ble in of w	t is solu- parts ater.	100 parts water dissolve at ordinary temperature.	Solubility in Alcohol, &c.		
	Cold.	Boiling.	ya.			
				*		
Silver, acetate	100		1			
,, carbonate	insol.					
,, chlorate	5	2	20			
,, citrate1	insol.					
,, cyanide	insol.	• •				
,, fluoride ²	V.S.	V.S.				
,, nitrate	0.44	0.1	227	1 in 26, 90%		
,, nitrite	8.8.		7.75			
,, sulphate	. 87		1.15			
,, sulphocyanide	insol.	• •	• •			
,, tartrate	insol.	v.s.	36	1 in 50, 90%; insol. in		
Sodium, acetate bicarbonate	11.3	dec.	8.8	ether		
highwaynata	1	0.6	100	Геспет		
higalphita	v.s.	0.0				
hoveto	121	. 1	8			
,, bromide	1.1	0.9	90	1 in 15		
,, carbonate (dry)	6	2.2	16.2			
,, ,, (cryst.)	1.56	V.S.	63.2			
,, chloride	3	21/2	35			
,, chloroplatinate	sol.					
,, citrate	sol.		.:	S.S.		
,, fluoride	25	• •	4			
,, hydrate (caustic)	V.S.	v.s.	170	insol.		
,, hyposulphite	0.6	v.s. 0·4	170 166	insol.		
,, iodide	1.1	0.6	85			
ovelete	35		3			
mhaamhata	6.7	i	15			
", sulphide	v.s.	V.S.				
,, sulphite (cryst)	2.2	1	45			
,, ,, (dry)	4		25			
,, tri-basic phosphate	0.5	V.S.	20			
,, tungstate	8 to 12		-::	insol.		
,, (meta) vanadate	7 07	V.S.	200	1: 70 000/		
Strontium, bromide	1.01	12	100 51	1 in 30, 90%		
" chloride	1·96 1·33	0.6	75			
,, ,, (cryst.)	0.56	0.25	18			
nitrate	1.41	1	71			
Thiocarbamide	11	v.s.	9	v.s. also in ether		

Readily soluble in ammoria and hypo.
 AgF.4H₂O is almost as soluble as calcium chloride.

TABLE OF THE SOLUBILITIES, &c.-CONTINUED.

Name.		t is solu- parts ater.	100 parts of water dissolve at ordinary temperature.	Solubility in Alcohol,
Thiosinamine Thymol Tin (stannous), chloride. Uranium, acetate. , chloride ,, nitrate. Zinc, sulphate	v.s. v.s.	v.s. v.s. v.s. v.s.		1 in 2 90 %; also in eth. 1 in 3.75 90%; also in [ether.

PERCENTAGE OF REAL AMMONIA IN SOLUTIONS OF DIFFERENT DENSITIES AT 14° CENTIGRADE,-CARIUS.

: ; eci Gravi		Specific Gravity.	Per- centage Ammonia	Specific Gravity.	Per- centage Ammonia	Specific Gravity.	Per- centage Ammonia
0.884	4 36.0	0.9052	27.0	0.9314	18.0	0 9631	9.0
0.886	4 35.0	0.9078	26.0	0.9347	17.0	0.9670	8.0
0.888	5 34.0	0.9106	25.0	0.9380	16.0	0.9709	7.0
0.890	7 33.0	0.9133	24.0	0.9414	15.0	0.9749	6.0
0.892	9 32.0	0.9162	23.0	0.9449	14.0	0.9790	5.0
0.895	3 31.0	0.9191	22.0	0.9484	13.0	0 9831	4.0
0.897	6 30.0	0.9221	21.0	0.9520	12.0	0.9873	3.0
0.900	1 29.0	0.9251	20.0	0.9556	11.0	0.9915	2.0
0.902	6 28.0	0.9283	19.0	0.9503	10.0	0 9959	1.0

INDICATORS

(I.e., Colour Tests for Alkalies and Acids).

	Acid.	Alkaline.	In presence of Carbon Dioxide.
Litmus Cochineal Methyl orange Phenol-phthalein	Bright red	Blue	Reddish purple
	Yellow	Reddish violet	Not affected
	Red	Yellow brown	Not affected
	Colourless	Intense red	Useless

REACTION OF SUBSTANCES TO VARIOUS INDICATORS.

Substance.	Litmus.	Methyl Orange.	Phenol- phthalein.
Alum Borax Potass metabisulphite Po ass oxalate Rochelle salt Silver nitrate Sodium bicarbonate Sodium citrate Sodium bisulphite Sodium sulphite Sodium phosphate	acid alkaline acid neutral neutral acid alkaline acid alkaline acid alkaline	neutral alkaline neutral neutral neutral alkaline alkaline alkaline alkaline	acid neutral acid neutral neutral acid neutral acid neutral neutral acid neutral

A TABLE OF ATOMIC WEIGHTS OF THE CHEMICAL ELEMENTS.

Name.	Symbol.	Atomic Weight in Round Numbers.	Accurate Atomic Weight.
Aluminium Antimony Argon Arsenic	Al Sb A As	27 120 40 75	27·1 120·2 39·9 75·0
Barium Beryllium Bismuth Boron Bromine	Ba Be = Gl Bi B Br	137 9·1 208 11 80	137·43 9·1 208·0 11·00 79·96
Cadmium Cæsium Calcium Carbon Cerium Chlorine Cromium Cobalt	Cd Cs Ca C C Ce Cl Cr Cr	112 133 40 12 140 35·5 52 59	112·4 132·9 40·1 12·0 140·25 35.451 52·11 59·00
Cobalt	Cu Er F	63·5 166	63·60 166·0 19·0
Gadolinium Gallium Germanium Gold.	Ga Ge	156 70 72.5 197	156·01 70·0 72·5 197·2
Helium		4	4·0 1·008
Indium Iodine Iridium Iron	I Ir	115 127 193 56	115·0 126·97 193·0 55·9
Lanthanum Lead Lithium	. Pb	139 207 7	138·9 206·92 7·03
Magnesium Manganese Mercury	Mn	24 55 200	24·36 55·0 200·0

A TABLE OF ATOMIC WEIGHTS-Continued.

NAME.	'Symbol.	Atomic Weight in Round Numbers.	Accurate Atomic Weight.
Molybdenum	Мо	96	96.0
Neodymium Nickel Niobium Nitrogen	Nd	144	143·6
	Ni	59	58·70
	Nb=Cb	94	94·0
	N	14	14·04
Osmium	Os	191	191.0
Oxygen (Standard)	O	16	16·0
Palladium Phosphorus Platinum Potassium Praseodymium	Pd	106	106·5
	P	31	31·0
	Pt	193·4	194·8
	K	39	39·15
	Pr	141	140·5
Rhodium	Rh	103	103·0
Rubidium	Rb	85	85·5
Ruthenium	Ru	102	101·7
Samarium Scandium Selenium Silicon Silver Sodium Strontium Sulphur	Sm	150	150·3
	Sc	44	44·1
	Sc	79	79·2
	Si	28	28·4
	Ag	108	107·93
	Na	23	23·05
	Sr	87.5	87·6
	Sr	32	32·06
Tantalum Tellurium Terbium Thallium Thorium Thulium Tin Titanium Tungsten	Ta Te Tb Tl Th Tu Sn Ti W	183 128 160 204 233 171 118 48 184	183·0 127·6 160·0 204·1 232·5 171·0 119·0 48·1 184·0
Uranium Vanadium Ytterbium Yttrium Zinc Zirconium	U	240	238·5
	V	51	51·4
	Yb	173	173·0
	Yt	89	89·0
	Zn	65	65·4
	Zr	91	90·6

TARLE OF POTSONS AND ANTIDOTES. Compiled by J. V. Erspen.

		sus.	with paste	usion t effi.	pplied k.	medi-	onate er of vater.	,	d and given	spira-	
		Chalk, whiting, or magnesia sus- pended in water. Plaster or mortar can be used in emergency. Vinegar and water.	White and yolk of raw eggs with milk. In emergency, flour paste may be used. Sulphates of soda or magnesia. Finetic of sulphates of sine	No certain remedy; cold affusion over the head and neck most effi-	cacious. Sulphate of iron should be applied immediately. Emedics and magnesia, or chalk.	Common salt to be given immedi-	ately, followed by emetics. Bicarbonate of soda, or carbonate of magnesia or chalk, plaster of the apartment beaten up in water,		Vomiting should be encouraged and gruel, arrowroot and starch given	Cold affusion and artificial respira-	
	Antidote.	halk, whiting, or magnes pended in water. Plaster or can be used in emergency. inegar and water.	hite and yolk of raw egg milk. In emergency, flou may be used. Inhates of soda or magnesi	medy;	on shou	to be g	ately, followed by emetics, learbonate of roda, or ca of magnesia or chalk, plue apartment beaten up i		ld be en	and art	violi:
DEN.	A	Chalk, whiting, or pended in water. can be used in en Vinegar and water.	hite and yol milk. In en may be used.	tain re	cacious. Ilphate of ir immediately.	on salt	, followed on a generia partmen	ΰ	ng shou	ffusion	
TABLE OF POISONS AND ANTIDOTES. Compiled by J. V. EISDEN,		Chalk, pendl can b Vinega	White milk may Sulpha	No cer over	Sulphate immedia Emetics a	Comm	Bicarb of m	fraction has claused deseated. Tracker has claused that. ACRIT AOD, concentrated, has as powerful an effect as the mineral acids.	>	Cold 8	LIOII.
by J.	202	Hot burning sensation in throat and stomach; vomiting, cramps, and numbness. Swelling of tongue, mouth, and fauces; often followed by stricture of the casophagus.	Acrid, metallic asse, constriction and burning in throat and stomach, followed by nausea and vomiting. Onstriction in the throat and at city of stomach: crampy nains	; blue espira-	vomit-	ss and	Corrosion of windpipe and violent inflammation.	the min	Acrid taste, tightness about the throat, vomiting.	n.	
pelidu	mptom	ion in iting, c moutl	e, constri throat by nauses throat a	bdomen is. asping r	e jaws.	ne sore	pe and	ffect as	ess abo	lorofor	
Con	Characteristic Symptoms.	Hot burning sensation in throat and stomach; vomiting, cramps, and numbness. Selbling of tongue, mouth, and fauces; often followed by stricture of the casophagus.	Acrid, metallic taste, constriction and burning in throat and stomach, followed by nausea and vomiting. Onstriction in the throat and at constriction in the throat and at city of stomach: crammy nains	and stiffness of abdomen; blue line round the gums. Insensibility, slow gasping respira- tion, dilated publis, and spar-	modic closure of the jaws. Smarting sensation. Irritant pain in stomach and vomit-	troublesome sores and rritant.	windpi	ful an e	tightnaiting.	Effects similar to chloroform	
OLES	haracte	ot burning sel and stomach; and numbness. velling of ton fauces; often ture of the ceso	and burni stomach, fo vomiting.	stiffne round t sibility, dilate	modic closure of f Smarting sensation Irritant pain in stor		prrosion of winflammation.	power	rid taste, tight	ts simil	
OLL	Ö	Hot band and and swelli faucture	Acrid, and stome vomin	and line Insen	Smart Irritar	ing. Produces ulcers. Powerful i	Corros	l, has a		Effect	
IND A		mallest a may a of the	known is still	3 grs.	ds and	abra-	fumes fumes	tal.	tion; 3		
ONO	Remarks.	I drachm is the smallest fatal dose known. Vapour of ammonia may cause inflammation of the lungs	an an	a. Taken internally, 3 grs.	Applied to wounds abrasures of the skin. Taken internally.	b. Applied to slight abrasions of the skin.	drachms have been fatal. Inhalation of the fumes has also been fatal.	drachm has been fatal. ACETIC ACID, concent	Variable in its action; grains have been fatal.	d.	
FOLS	Rem	drachm is the latal dose known, pour of ammor cause inflammatiungs	3 grains the smalle fatal dose. The sub-scetate more noisonous	ken int	plied to	Applied to sligh sions of the skin.	alation also be	thm has	ble in ins hav	When inhaled.	
E OF		- 00	3 gran fata The	a. Tak	, e	b. Ap	2 drac Inh has	I drac	Varia	When	
TABL		ATE	RIDE	FASSIUM	POTAS-	VER	45				
	Poisons.	Acro, ng M Oxal	OF LE	or Por	ATE OF	OF SIL	CID	IC ACID			
		OXALIC ACID, including Porassium OXALATE AMMONIA POTASH	Mercuric Chloride Acetate of Lead	CYANIDE OF POTASSIUM	BICHROMATE OF POTAS-	SIUM NITRATE OF SILVER	NITRIC ACID	SULPHURIC ACID	IODINE	ETHER	
	Veg	etable Caustio		Ietallic i	Salts.		oncentra lineral A	ted			

THERMOMETRIC TABLES,

Showing the Assimilation of the Thermometers in Use throughout the World.

Centigrade.	Réaumur.	Fahrenheit.	Centigrade.	Réaumur.	Fahrenheit
100	80.0	212.0	49	39.2	120.2
99	79.2	210.2	48	38.4	118.4
98	78.4	208.4	47	37.6	116.6
97	77.6	206.6	46	36.8	114.8
96	76.8	204.8	45	36.0	113.0
95	76.0	203.0	44.	35.2	111.2
94	75.2	201.2	43	34.8	109.4
93	74.4	199.4	42	33.6	107.6
92	73.6	197.6	41	32.8	105.8
91	72.8	195.8	40	32.0	104.0
90	72.0	194.0	39	31.2	102.2
89	71.2	192.2	38	30.4	100.4
88	70.4	190.4	37	29.6	98.6
87	69.6	188.6	36	28.8	96.8
86	68.8	186.8	35	28.0	95.0
85	68.0	185.0	34	27.2	93.2
84	67.2	183.2	33	26.4	91.4
83	66.4	181.4	32	25.6	89.6
82	65.6	179.6	31	24.8	87.8
81	64.8	177.8	30	24.0	86.0
80	64.0	176.0	29	23.2	84.2
79	63.2	174.2	28	22.4	82'4
78	62.4	172.4	27	21.6	80.6
77	61.6	170.6	26	20.8	78.8
76	60.8	168.8	25	20.0	77.0
75	60.0	167.0	24	19.2	75.2
74	59.2	165.2	23	18.4	73.4
73	58.4	163.4	22	17.6	71.6
72	57.6	161.6	21	16.8	69.8
71	56.8	159 8	20	16.0	68.0
70	56.0	158.0	19	15.2	66.2
69	55.2	156.2	18	14.4	64.4
68	54.4	154.4	17	13.6	62.6
67	53.6	152.6	16	12.8	60.8
66	52·8 52·0	150.8	15	12.0	59.0
65 64	51.2	149.0	14	11.2	57.2
63	50.4	147.2	13	10.4	55.4
62	49.6	145.4	12	9.6	53.6
61	48.8	143.6	11	8.8	51.8
60	48.0	141.8	10	8.0	50·0 48·2
59	47.2	140.0	9 8	7.2	46.4
58	46.4	138.2	7	6.4	
57	45.6	136.4	6	5.6	44.6
56	44.8	134.6	6	4.8	42·8 41·0
55	44.0	132·8 131·0	5 4	4.0	39.2
54	43.2		3	3.2	39.2
53	42.4	129·2 127·4	2	2.4	
52	41.6	125.6	1	1.6	35.6
51	40.8	123.8	0	0.8	33.8
50	40.0	122.0	U	0.0	32.0

THERMOMETRIC RULES.

The following rules for the rapid conversion of degrees in one system into another will be found useful:—

To Convert Centigrade into Fahrenheit: Degrees Centigrade \times 9 ÷ 5 + 32. Ex.—80° C. \times 9 ÷ 5 = 144 + 32 = 176° F.

To Convert Centigrade into Réaumur:

Degrees Centigrade $\times 4 \div 5$.

Ex. -60° C. $\times 4 \div 5 = 48^{\circ}$ R.

To Convert Fahrenheit into Centigrade: (Degrees Fahrenheit -32) $\times 5 \div 9$. Ex.—100° F. $-32 = 68 \times 5 \div 9 = 37.8$ C.

To Convert Fahrenheit into Réaumur: (Degrees Fahrenheit -32) \div 9 \times 4. Ex. -95° F. $-32 = 63 \div 9 \times 4 = 28^{\circ}$ R.

To Convert Réaumur into Centigrade Degrees Réaumur \times 5 ÷ 4. Ex.—80° R. \times 5 ÷ 4 = 100° C.

To Convert Réaumur into Fahrenhei Degrees Réaumur $\times 9 \div 4 + 32$. Ex.—16° R. $\times 9 \div 4 = 36 + 32 = 68$ ° F.

ORTHOCHROMATIC DATA.

DISTRIBUTION OF THE COLOURS IN THE SPECTRUM.

(ACCORDING TO LISTING.)

Wave length					Wave length.				
Brown		Limit		819 8 768·6	CYAN BLUE	Limit	***	491·9 473·0	
RED		Limit Middle		723·4 683·2	Indigo	Limit	• • •	455·5 439·2	
ORANGE		Limit Middle		647·2 614·9	VIOLET	Limit Middle		424·0 409·9	
YELLOW		Limit Middle		585·6 559·0	LAVENDER	Limit Middle	• •	396·7 384·3	
GREEN		Limit Middle		534·7 512·4		(Limit	• •	372.6	

WAVE LENGTHS OF BRIGHT LINES OF ELEMENTS USED IN PLOTTING OUT THE SPECTRUM.

(In Ten-Millionths of a Millimetre Angstrom Units.)

TABLE I.

Name of line.	Colour.	Salts used.	Wave lengths = \(\lambda\)
Lithium Lithium D "Little b" Strontium Calcium Potassium	Red Orange Orange Green Blue Blue Violet	Lithium chloride or nitrate Lithium chloride or nitrate Sodium chloride or bicarbonate Magnesium ribbon Strontium chloride or metal Calcium nitrate or chloride Potassium chloride	6705 6102 5893 5183 4607 4227 4080

Table I. has been drawn up so as to enable any one with nothing more than an ordinary Bunsen gas burner to construct a chart, by means of which the position of any Fraunhofer line in the spectrum may be determined with sufficient accuracy for all photographic purposes. The salts should be dissolved in distilled water so as to form a saturated solution, a narrow loop of copper or iron wire should be wound with fibrous asbestos, and this repeatedly heated in the Bunsen and allowed to cool.

TABLE II.

C "Little b" F Magnesium G "Little h"	Red Green Bluish-green Blue Blue Blue	Hydrogen tube Magnesium rod Hydrogen tube Magnesium rod Hydrogen tube Hydrogen tube	• •	• •	6563 5183 4861 4481 4308 4102
---------------------------------------	--	--	-----	-----	--

Table II. will give the data, most easily obtained if a small induction coil is used. A small coil, giving a fat \(\frac{1}{2} \) or \(\frac{3}{2} \) in. spark, and actuated by three bichromate bottles will suffice to show the lines in this table. The hydrogen tube is, of course, of the well-known Plucker or Salet form. The magnesium may be used in twisted spirals of ribbon, but preferably in rod form, and the rods should be filed to comparatively sharp points. The constricted portion of the vacuum tube and the points of the magnesium rod should be placed parallel to and not at right angles to the slit.

EXPOSURE TABLES.

The following table, based on that of Burton, gives a rough idea of the exposures for various subjects and diaphragms under the following conditions:—

Best lighting; midday sunshine in May, June, and July.
 With the most rapid commercial plates. See below for factors

applying to other conditions.

F/ No.	Average Subject with objects in Fore- ground. Street Scenes. Outdoor Figure Studies.	Landscapes with Light Foreground, Lake, River, and Beach Scenes.	Sea Clouds and Sky.	Subjects with Extra Heavy Foreground, e.g., Dark Trees, Doorways, Groups.	Under Trees, Woods, Avenues, Glades, etc.	Portrait in Average Well-lighted Room.
f/4 f/4·5 f/5·6 f/6·3 f/7 f/8 f/11 f/16 f/22 f/32 f/45 f/64	1/250 1/200 1/130 1/100 1/80 1/64 1/30 1/15 1/8 1/4 1/2	1/500 1/400 1/250 1/250 1/150 1/150 1/60 1/30 1/15 1/8 1/4	1/1000 1/800 1/600 1/300 1/150 1/80 1/40 1/20 1/10	1/120 1/100 1/64 1/50 1/40 1/30 1/15 1/8 1/4 1/2	1/20 1/15 1/10 1/8 1/7 1/5 1/2 1 2 4 8 16	1/8 1/7 1/4 1/3 2/5 1/2 1 2 4 8 16 30

In weather other than bright sunshine the above exposures are multiplied as follows:—

At other hours of the day and times of the year the above exposures are multiplied by the numbers in the following table of daylight variation. Figure in the table indicates times for which the above exposures are correct.

VARIATION IN DAYLIGHT FROM MORNING UNTIL EVENING (FOR LATITUDE OF BRITISH ISLES, NORTH GERMANY, Etc.).

		Morning.								
		12	11	10	9	8	7	6	5	4
January February March	••	3½ 2 1½ 1½ 1¼	4 2½ 1½ 1½ 1½	5 3 14 14	12 4 2 1½	10 3 2	6 3	6		
May June July August	••	1 1 1 1 <u>1</u>	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1 1 1 ₁	11/2 11/2 11/2	$ \begin{array}{c} 1_{\frac{1}{2}} \\ 1_{\frac{1}{2}} \\ 1_{\frac{1}{2}} \\ 2 \end{array} $	2½ 2 2½ 3	3 2½ 3 6	6 5 6	12
September October November December	••	1½ 2 3½ 4½	11/2 21/2 4 5	13 3 5 6	2 4 12	3 10	6			
		12	1	2	3	4	5	6	7	8
		AFTERNOON.								

PINHOLE EXPOSURES.

(WATKINS-POWER NUMBERS.*)

W.P. No.	Diar	neter.	Nearest Needle Size.	Good Working Distance.		
1 2 3 4 5 6 7 8	Inch. 0·160 0·080 0·053 0·040 0·032 0·027 0·023 0·620	Inch. 13 15 15 25 31 38 44 52		1nches. 40 20 14 10 8 5		

Rule for use of W.P. No. in Column 1.—Multiply W.P. No. of aperture by its working distance from plate. Use the result as the f/No. in calculating exposure by meter, tables or other means. Whatever the calculated result is in seconds or fractions of a second, expose that number of minutes or fractions of a minute. Example.—W.P. 6 at 8 inches calculate as f/48.

^{*} The principle of this system will be understood from a consideration of an example of focal aperture:—A $\frac{1}{4}$ -inch aperture at 9 inches = f/36. If every second on the actinometer is to be reckoned a minute, the aperture must be one-sixtieth the area, that is the diameter must be divided by $\sqrt{60}$ or, near enough, by $\sqrt{64} = 8$. Therefore, an aperture of $\frac{1}{4} \div 8 = \frac{1}{32}$ inch diameter = f/36 when minutes are given instead of seconds. Therefore, reasoning backwards, a pinhole of $\frac{1}{32}$ -inch diameter is called No. 4 (32 ÷ 8). Similarly one of half the diameter is No 8, and so on. Mr. Watkins, in order to allow for the exposure in excess of the theoretical which is needed in pinhole photography, calculates minutes as seconds at $\frac{1}{40}$ instead of $\frac{1}{60}$, the area of aperture, and therefore his so-called W.P. (Watkins-Power number) is obtained by dividing the denominator of the fraction which expresses the diameter of the pinhole by 6·3 instead of 8. Thus, in the case of a $\frac{1}{38}$ -diameter hole, $\frac{1}{38}$ ÷ 6·3 = 6·2, or, near enough. W.P. No. is 6.

TABLE OF COMPARATIVE PLATE SPEED NUMBERS.

H & D.	Watkins P No.	Wynne F. No.	H & D.	Watkins P No.	Wynne F No.
10	15	24	220	323	114
20	30	28	240	352	120
40	60	49	260	382	124
80	120	69	280	412	129
100	147	77	300	441	134
120	176	84	320	470	138
140	206	91	340	500	142
160	235	103	380	558	150
200	294	109	400	588	154

The above Watkins and Wynne numbers are equivalent to the H and D, only when the latter is determined in accordance with the directions of Hurter and Driffield, that is with pyro-soda developer and using the straight portion only of the density curve.

To convert H and D into Watkins:—Multiply H and D by 50 and divide by 34. For all practical purposes the Watkins P number is

11 times H and D.

To convert Watkins into Wynne F. Nos.: -Extract the square root

and multiply by 6.4.

The above methods have been approved by the Watkins Meter Company and the Infallible Exposure Meter Company with reference to "Wratten" plates, but the comparisons here given may not hold good with every other plate.

SHUTTER SPEEDS FOR MOVING OBJECTS.

From the "Wellcome Exposure Record and Diary."

The formula and table given below indicate the shutter speeds necessary to secure negatives sufficiently sharp for direct printing. For enlarging it is better to give \(\frac{1}{2}\) to \(\frac{1}{2}\) these exposures, or to work further from the object. The figures are no guide to what is the correct exposure for the plate.

If D = distance of object in feet, F = focal length of lens, S = speed of object in feet per second, and E = exposure for an object moving

across the field of view, then

$$\mathbf{E} = \frac{\mathbf{D}}{100 \; \mathbf{F} \times \mathbf{S}}$$

The following table gives in round figures the shutter speeds necessary for various moving objects, using the ordinary quarter plate lens of about 5 in. focus. The column A is for objects moving directly towards the operator, B for objects moving obliquely towards or from the camera, that marked C for objects moving directly across the field of view.

Distance of Object, 25 ft., unless otherwise stated.	A.	B.	C.
Street groups (no rapid motion) Pedestrians (two miles per hour) Animals grazing Pedestrians (three miles per hour) Pedestrians (three miles per hour) Vehicles (six miles per hour) Vehicles (eight miles per hour) Cyclists and trotting horses Foot races and sports Divers Cycle races, horse galloping Yachts (10 knots per hour) at 50 ft. Steamers (20 knots per hour) at 50 ft. Trains (30 miles per hour) at 50 ft. Trains (60 miles per hour) at 50 ft.	1/20 1/30 1/40 1/60 1/80 1/160 1/240 1/300 1/120 1/150 1/300	75 to 1/10 1/40 1/60 1/80 1/120 1/150 1/300 1/500 1/600 1/750 1/120 1/240 1/300 1/600	1/60 1/90 1/120 1/180 1/250 1/700 1/800 1/900 1/180 1/360 1/450 1/900

At 50 ft. the exposure may be double that at 25 ft. At 100 ft. the exposure may be double that at 50 ft.

OPTICAL CALCULATIONS.

Optical Rules and Equations. CONJUGATE FOCI.

Let f = focal length.

u = nodal distance of object measured from node of admission.

v = nodal distance of image measured from node of emission, d = extra focal distance of object measured from front principal

focus; i.e., from one focal length in front of lens.

x = extra focal distance of image measured from back principal focus; i.e., from one focal length behind lens.

R =linear ratio of $\frac{\text{object}}{\text{image}}$. This is greater than 1 when re-

ducing; less than 1 when enlarging.

Then
$$u = \frac{vf}{v-f} = Rv = (R+1)f.$$

$$v = \frac{uf}{u-f} = \frac{u}{R} = \left(\frac{1}{R} + 1\right)f.$$

$$d = u-f = \frac{f^2}{x} = Rf.$$

$$x = v-f = \frac{f^2}{d} = \frac{f}{R}$$

Definitions.—Principal Focus.—This is the focus to which the lens brings parallel rays emanating from a point at an infinite distance. If we focus directly on a star the image is at the back principal focus. A corresponding point in front of the lens at the position the image would occupy if the lens were reversed is the front principal focus.

Node.—If we focus on a distant star the image will remain stationary when the lens is rotated through a small arc in any direction about one fixed point. This point is the node of emission. The node of admission is a corresponding point that will have the same properties if the lens is reversed.

A distance measured from a node is termed a nodal distance.

A distance measured from a principal focus is an extrafocal distance. In general

it is most convenient to measure distances in this way.

The nodal distance of back principal focus from node of emission is equal to that of the front principal focus from node of admission, and is called the focal length of the lens.

SCALE OF IMAGE.

Let
$$r = \text{ratio of } \frac{\text{image}}{\text{object}}$$

Then
$$r = \frac{1}{R} = \frac{v}{u} = \frac{f}{d} = \frac{x}{f}$$

CALCULATION OF FOCAL LENGTH.
Various useful methods can be based on following equations

$$= \frac{vu}{v+u} = \frac{u}{R+1} = \sqrt{dx} = Rx = \frac{d}{R}$$

As simple and accurate a method as any is first to focus the lens on an object at an infinite distance (see table on page 898), and to mark the position of any convenient part of the moving lens front on the fixed camera baseboard, then place any object such as a foot rule before the camera, and tocus—by moving only (1) camera as a whole and (2) camera front on baseboard, not back of camera—until image on screen is same size as original. The distance through which the camera front has to be moved to secure this is the focal length of the lens, and is indicated by the separation of the mark on the fixed baseboard from that on the lens front in its final (same size) position.

COMBINING LENSES.

Let

 f_1 and f_2 = focal lengths of respective lenses.

s = separation measured from node of emission of front lens to node of admission of back lens (termed nodal separation).

F =focal length of combination.

Then

$$F = \frac{f_1 \, f_2}{f_1 + f_2 - s}$$

If one lens is a symmetrical doublet and the other a supplementary lens placed *inside* the doublet, then, approximately, s = half the extreme outside length of the doublet. The value of s should not be neglected unless very small.

EXPOSURE.

In exposure we consider effective aperture, and the diameter of the effective aperture is that of the largest parallel beam of light that can enter and pass through the objective.

Let e = v divided by diameter of effective aperture = so-called "ratio number" of aperture, f, r, and v represent same quantities as before.

Then $\frac{v}{e}$ = diameter of effective aperture

$$=\frac{f}{e}$$
 when object is distant.

Exposure always varies inversely with $\left(\frac{v}{e}\right)$

With any one lens it varies directly in proportion to the value of e^2 , or of v^2 , or of $(r+1)^2$, if either the stop or the scale is altered.

With different lenses with apertures of same diameter exposure varies directly with f2, provided images of the same size are produced from near objects, as in copying. If images of different sizes are produced exposure varies directly with f2, only when focussing on infinity. In all other cases the value of $\left(\frac{v}{e}\right)^2$ must be deter-

mined to compare relative exposures.

Exposure is always the same so long as the value of e is the same, however much other factors may be varied.

DEPTH OF FIELD.

Depth of field is governed by angular aperture, which is a measure of the angle at the apex of the cone of light reaching the plate when focussing on an infinitely distant point of light. The diameter of the angular aperture is the diameter of the base of the cone when its height is made equal to the focal length. Depth is often calculated on effective aperture; this introduces small errors that are very generally ignored.

Let a = focal length divided by diameter of angular aperture.

c = diameter of circle of confusion. Usually taken as 0.01 inch, but for critical definition 0.005 is necessary.

H =hyperfocal distance. See definition below.

Then
$$H = \frac{f^2}{ac} = \frac{100f^2}{a}$$
 when $c = 0.01$ inch,

measuring all distances from node of admission.

If we focus on infinity the nearest object in focus is at a A table of various values of H will be found later distance = H.in this volume.

If we focus on a distance equal to H + f, all objects are in focus from $\frac{H+f}{2}$ up to infinity. This is the maximum amount of depth possible.

If we focus on a point at a distance u the distance of nearest object

$$= \frac{Hu}{H+u-f} = \frac{Hu}{H+d}$$

and the distance of farthest object in focus

$$\frac{\ddot{Hu}}{H - u + f} = \frac{Hu}{H - d}$$

When f is small compared with u it can be disregarded, and u and d can be considered equal, while distances can be measured either from the node or the principal focus.

Very approximately, when we focus on a distance equal to $\frac{H}{n}$ depth extends from $\frac{H}{n+1}$ to $\frac{H}{n-1}$

If an image produced with a lens of focal length f and with aperture of f/ number a is enlarged n times the result is equivalent, both as regards size and depth, to one produced directly with a lens of focal length nf and aperture f number na, that is, an aperture of the same diameter.

To produce the same depth with two different lenses the aperture f numbers must vary in proportion with the squares of the focal

lengths

PERSPECTIVE

is controlled entirely by distance of object from entrance pupil of lens. The entrance pupil is the image of the stop aperture seen through the front lens. If the lens is rotated about the centre of the pupil, the stop appears to remain stationary. In a landscape lens the pupil is the stop. In a symmetrical doublet it is the node of admission. In a telephoto lens it is the node of admission of the front combination, not that of the entire objective.

The proper viewing distance for the print is equal to v, excepting in

the cases considered below.

CORRECTION FOR INCONSTANCY OF APERTURE.

With many lenses the aperture varies according to the side of the lens that it is measured upon, and in such cases it varies in diameter with the distance of the object, or is inconstant. All preceding rules and formulæ assume it to be constant, hence the results are in error for near objects. They can, however, be corrected by the following method. The correction for exposure is important when such a lens is used for enlarging. See table of "Relative Exposures for Varying Proportions of Image to the Original."

Let y = distance between entrance pupil and node of admission. If

pupil is in front of node y is positive; if behind node y is

negative.

The depth is corrected by multiplying results obtained by ordinary formulæ by $1 + \frac{y}{u}$ Exposure by multiplying by

 $\left(1+\frac{y}{u}\right)^2$ Viewing distance = $v\left(1+\frac{y}{u}\right)$ Perspective varies with value of u-y.

When object is distant $1 + \frac{y}{u} = 1$ therefore no correction is

required. With constant lenses y = o.

The value of y can be measured directly by taking advantage of the facts that, with the objective reversed, the image is stationary when the objective is rotated about its node of admission; and that the apparent stop aperture seen through the front combination is stationary when the objective is rotated about the centre of the entrance pupil.

The telephoto lens is inconstant, but by adopting the usual magnification method of making calculations, all above corrections are allowed for. If, however, we treat the telephoto as a complete objective of certain focal length, then with near objects the corrections

must be made, otherwise all the results obtained are wrong.

CORRECTION OF CONVERGENT DISTORTION.

The distorted image must be corrected by copying in the camera on an enlarged scale, with distorted image and enlargement inclined in opposite directions. A corrected and enlarged positive can thus be made from the original negative, or a corrected enlarged negative from a transparency made from the original by contact printing.

Let A = angle of tilt of camera back from vertical at time of

original exposure.

Let N = angle of inclination from vertical of distorted image in correc-

tion process.

Let C =angle of inclination from vertical of new enlarged copy.

Then use original lens, and adjust apparatus to enlarge on scale of 2 to 1, taking measurements on a horizontal line through centre of plate.

Make C equal to A.

Adjust N until convergency disappears. Stop down as required to secure focus.

Care must be taken to preserve the proper scale of enlargement, which may be upset in adjusting the angles C and N. The enlargement must not be less than 2 to 1, but may be more with advantage.

If A is not recorded it can be easily found, for, when enlarging on scale of 2 to 1, it is equal to $\frac{2}{3}$ the angle of inclination required to remove convergency by tilting either copy or distorted image alone.

If A does not exceed 16°, the method given is sufficiently accurate for all practical purposes. The theoretically exact method is impractically complex.

Though convergency can be corrected by inclining either copy or distorted image alone the result is incorrect, as the height of the

image is then either increased or very much dwarfed.

If a reduced corrected copy is required, the required particulars can be taken from the following table. The first column gives the value image

of r or of $\frac{1}{\text{object}}$. The second and third the proper values of the angles C and N. The fourth the factor for finding A when that angle is not known, and the fifth the extreme value of A for which the table gives approximately correct results. In applying Column 4 the new copy (or the focussing screen) must be inclined alone until convergency disappears, the negative being upright. A is then equal to the angle found multiplied by the number given. The original lens is to be used.

r	C	N		
1	2	3	4	5
THE POST CHORDON	2·6 <i>A</i> 2·12 <i>A</i> 1·66 <i>A</i> 1·45 <i>A</i> 1·34 <i>A</i>	2·4 <i>A</i> 1·87 <i>A</i> 1·33 <i>A</i> 1·05 <i>A</i> 0·9 <i>A</i>	न्द्रियान्त्री नक द्राविक स्थित	5° 7° 8° 9° 11°

When reducing sharp focus can only be secured with the aid of a small stop. When enlarging a bigger aperture can be employed.

STEREOSCOPIC FACTS AND FIGURES.

True stereoscopic effect depends on true perspective.

True aerial perspective depends on true gradation and values.

True linear perspective upon absence of distortion, and upon viewing every part of the images at the same angle of convergency as that at which it was seen by the camera lenses.

To secure correct conditions of convergency each print must be seen under the same angle of view as that at which it was produced,

and the two prints must be mounted in accord with the following rules :-

Let P = separation of any pair of corresponding points on prints.

N = separation of same points on negatives.

E = separation of eyes (average is 64 mm.).

L = separation of camera lenses.A non-prismatic stereoscope being used :-

1. If image points represent infinitely distant objects, make P = E.

2. If only near objects are shown and an ordinary single plate double lens stereo camera has been used

Make P = E + L - N.

3. If a single camera is used for two separate exposures, or if two separate similar cameras are used together, measure N with negatives placed edge to edge and in the same relative positions that they occupied during exposure, and then

Make P = E - N + length of one plate.

If a prismatic stereoscope, fitted with properly centred half lenses is used, add the width of one prism to above values of P.

Hints .- 1. Aim at soft negatives full of correct gradations, and use printing process showing as little grain and texture as possible.

2. Mount so that horizon line is opposite centre of eyes.

3. Trim so that separation of corresponding margins is only just less than that between images of nearest object.

4. Use light or dark mount according as subject is lighted from the

front or back.

magnification.

5. With very near objects adjust separation of camera lenses until each image shows required amount of subject.

TELEPHOTO CALCULATIONS.

F = equivalent focal length of complete lens.

 $f_1 = \text{equivalent focal length of positive.}$ f_2 = equivalent focal length of negative.

E = camera extension, from negative lens to ground glass.

M = magnification, that is number of times the image given by the complete leus is larger than that given by positive alone.

Magnification when working at given extension is found by dividing camera extension by focal length of negative lens and adding 1.

 $M=\frac{E}{f_2}+1.$

Camera extension, necessary for given magnification-multiply focal length of negative lens by magnification less 1.

 $E = f_2 (M-1)$ Focal length of complete lens .- Multiply focal length of positive by

DIAPHRAGM NUMBERS.

EQUIVALENT F/- AND UNIFORM SYSTEM NUMBERS.

Note.—Most lenses are now marked with the f/ numbers, although the U.S. numbers are used on Kodak lenses. Also the actual diameter of the diaphragm aperture in millimetres is marked on Zeiss lenses, such as the "convertible."

APPROXIMATE INFINITY FOR LENSES OF VARIOUS FOCAL LENGTHS.

BY C. WELBORNE PIPER, from "The First Book of the Lens."

FOCAL	DISTANCE O	F FOCUSSING-SCRE	EN BEHIND PRINC	IPAL FOCUS.
LENGTH, INCHES.	100 in.	250 in.	500 in.	1000 in.
1 23 4 5 6 7 8 9 112 12 13 16 17 19 12 21 22 24 25 28 30 33 35	3 yds. 11 '' 25 '' 45 '' 70 '' 100 '' 136 '' 178 '' 264 '' 351 '' 434 '' 525 '' 700 '' 875 '' 1056 '' 1225 '' 1406 '' 1600 '' 1 mile 1 miles 1 '' 1 miles 1 '' 2 ''	7½ yds. 28 7, 63 7, 113 7, 175 7, 250 7, 340 7, 4 mile 660 yds. 4 mile 1085 yds. 2 mile 1 7, 1½ miles 1, 1½ miles	15 yds. 55 ,, 125 ,, 125 ,, 225 ,, 350 ,, 680 ,, mile 1	30 yds. 110 ,, 250 ,, 450 ,, 700 ,, 1000 ,, 1360 ,, 1 mile 1½ miles 2 ,, 2½ ,, 3 ,, 4 ,, 5 ,, 6 ,, 7 ,, 8 ,, 9 ,, 10 ,, 13 ,, 15 ,, 18 ,, 20 ,,

By focusing accurately on distances not less than those given, we ensure that the focusing-screen is within $\frac{1}{100}$, $\frac{1}{250}$, $\frac{1}{500}$, or, $\frac{1}{1000}$ in from the true principal focus.

TABLE FOR ENLARGEMENTS.

Focus		TIMES	OF ENI	LARGEM	ENT AN	D REDU	CTION.	
Lens,	1	2	3	4	5	6	7	8
inches					inches			inches
3	6	. 9	12	15	18	21	24	27
	0	41/2	- 4	33	38	31/2	33	38
71	7	101	14	171	21	241	28	311
31/2	7	54	42	48	41	412	4	3 15
							32	36
4	8	12	16	20	24	28	14	
	0	6	51/3	5	44	423	7-7	41/2
41	9	131	18	224	27	311	36	403
41/2	9	63	6	55	5%	51	54	5 16
	10	15		0.5	30	35	40	45
5	10	15 7 1	20 63	25 6 1	6	5 <u>5</u>	54	55 55
	10	12	03	04		J 6	34	
51	11	161	22	271	33	384	44	491
37	11	81	71	67	68	65	64	6 3 16
-	12	10	24	30	36	42	48	54
6	12	18	8	71/2	71	7	6	63
	10		0	12	13			
7	14	21	28	35	42	49	56	63
	14	101	91	83	82	81	8	77
	16	24	32	40	48	56	64	72
8	16	12	103	10	93	91	93	9
		10	103					
9	18	27	36	45	54	63	72	81
	18	131	12	111	104	101	10%	101
7.0	20	30	40	50	60	70	80	90
10	20	15	131	121	12	114	113	111
11	22	33	44	55	66	77	88	99
	22	161	143	133	131	125	124	123
20	24	36	48	60	72	84	96	108
12	24	18	16	15	142	14	13#	131
-		-			- 5		1 4	2

The object of this table is to enable any manipulator who is about to enlarge (or reduce) a copy any given number of times, to do so without troublesome calculation. It is assumed that the photographer knows exactly what the focus of his lens is, and that he is able to measure accurately from its optical centre. The use of the table will be seen from the following illustration:—A photographer has a carte to enlarge to four times its size, and the lens he intends employing is one of six inches, equivalent focus. He must, therefore, look for 4 on the upper horizontal line, and for 6 in the first vertical column, and carry his eye to where these two join, which will be at 30—7½. The greater of these is the distance the sensitive plate must be from the centre of the lens; and the lesser, the distance of the picture to be copied. To reduce a picture any given number of times the same method must be followed, but in this case the greater number will represent the distance between the lens and the picture to be copied; the latter, that between the lens and the sensitive plate. This explanation will be sufficient for every case of enlargement or reduction.

RELATIVE EXPOSURES FOR VARYING PROPORTIONS OF IMAGE TO THE ORIGINAL.

(W. E. DEBENHAM'S TABLE.)

To find the relative exposure, add one to the number of times that the length of the original is contained in the length of the image, and square the sum. This will give the figure found in the third column of the annexed table.

As examples: suppose a copy is wanted having twice the linear dimensions of the original. Take the number 2, add 1 to it, and square the sum, 3²=9. Again, if a copy is to be of eight times the linear dimensions of the original, take the number 8, add 1, and square the sum, 9²=81. Copies respectively twice and eight times the size (linear) of the original will thus require relative exposures of 9 and 81—i.e., the latter will require nine times the exposure of the former.

It is convenient to have a practical standard for unity. An image of the same size as the original is a familiar case, and serves as such standard. By dividing the figures in the third column by four, we get at the figures in the last column, which represent the exposure required for varying degrees of enlargement or reduction, compared with the exposure for a copy of the same size.

The table is carried up to enlargements of thirty diameters; that is about the amount required for enlarging a carte-de-visite to life size.

The exposures required in reductions do not vary at all to the same extent that they do in enlargements. It has, therefore, not been thought necessary to fill in the steps between images of $\frac{1}{10}$ and $\frac{1}{20}$ and between $\frac{1}{20}$ and $\frac{1}{30}$ of the size of the original. Beyond $\frac{1}{30}$, there is scarcely any perceptible difference in the exposure until disturbance comes in from another cause, a considerable distance of illuminated atmosphere (haze or fog) intervening.

The figures in the second column will also serve as a table for distances from the lens to the plate and to the original, all that is necessary being to multiply by the principal focus of the lens in use. In the case of enlargements the figures less than 2 must be multiplied to get the distance from the original to the lens, and the figures greater than 2 for the distance from lens to image. For reductions the figures less than 2, multiplied by the principal focus of the lens, yield the distance from lens to plate; and the figures higher than 2, similarly multiplied, give the distance of original from lens.

With single "view lenses" the size of the effective aperture is different on the two sides of the lens, and the rapidity of the lens therefore varies with the side presented to the original. Therefore exposures can only be compared by the table when the same side of the lens is towards the original. The aperture also varies with the distance of the original, and the table does not accurately apply when enlarging. When reducing with a single lens the table gives approximately accurate results. It only applies accurately in all circumstances with doublets.

Proportion of	Distance of image		Exposures pro-
image to original (linear).	from lens* in terms of principal focus.	Proportionate exposures.	portioned to that required for copying same size.
10 10 10 10 10 10 10 10 10 10 10 10 10 1		1.07 1.10 1.21 1.27 1.36	0·27 0·28 0·3 0·31
D Tarana		1·56 2·25 3·06	0·39 0·56 0·76
(Same 1 size) 2 3 4 5	2 3 4 5 6	4 9 16 25 36	1 2·25 4 6·25 9
6 7 8 9	7 8 9 10 11	49 64 81 100 121	12·25 16 20·25 25 30·25
11 12 13 14 15	12 13 14 15 16	144 169 196 225 256	36 42·25 49 56·25 64
16 17 18 19 20	17 18 19 20 21	289 324 361 400 441	72·25 81 90·25 100 110·25
21 22 23 24 25	22 23 24 25 26	484 529 576 625 676	121 132•25 144 156•25 169
26 27 28 29 30	27 28 29 30 31	729 784 841 900 961	182·25 196 210·25 225 ·25 240

^{*} With a double lens it is usually sufficient to measure from the position of the diaphragm plate.

TABLE OF VIEW-ANGLES. By CLARENCE B. WOODMAN, Ph.D.

DIVIDE THE BASE* OF THE PLATE BY THE EQUIVALENT FOCUS OF THE LENS.

If the quotient is	The angle is	If the quotient is	The angle is	If the quotient is	The angle is
0·282 0·3 0·317 0·335 0·353 0·37 0·389 0·407 0·425 0·443 0·462 0·48 0·5 0·517 0·536 0·555 0·573 0·592 0·611 0·631 0·65 0·65 0·67 0·689 0·708 0·728	Degrees. 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	0·748 0·768 0·768 0·808 0·828 0·849 0·87 0·89 0·911 0·933 0·954 0·975 1·0 1·02 1·041 1·063 1·086 1·108 1·132 1·155 1·178 1·2 1·25 1·25 1·274	Degrees. 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65	1·3 1·32 1·36 1·375 1·4 1·427 1·45 1·48 1·5 1·53 1·56 1·59 1·62 1·649 1·678 1·7 1·739 1·769 1·8 1·833 1·865 1·898 1·931 1·965 2·0	Degrees. 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90

Example.—Given a lens of 13 inches equivalent focus; required the angle included by it on plate $3\frac{1}{4} \times 4\frac{1}{4}$.

Dividing 4.23 by 13, we have as quotient 0.327—midway between the decimals 0.317 and 0.335 of our table; therefore the required angle is 18° 30′.

The lengths of the diagonals of the plates most commonly used are :— $3\frac{1}{4} \times 3\frac{1}{4}$ diagonal 4.6 inches. [$7\frac{1}{3} \times 5$ diagonal 9.0 inches.

34	× 41 × 4	11	5.3 ,,	61	× 8	1 ,,	10.7	27
5	X-4-	. ,,	6.4,	 10	× - 8		12.8	- 99
43	$\times \frac{61}{2}$	25	8.0 ,,	12	\times 10	22	15.6	22
7	Y 5		8.6	15	v 10		19.2	

^{*} More accurately the diagonal of the plate, inasmuch as the field of the lens is circular, and if the corners of the plate are to be covered the angle embraced by the lens should be sufficient to cover the diagonal of the plate.

MR. E. M. NELSON'S TABLE OF DISTANCES FOR LANTERN PROJECTION.
DISTANCE OF PROJECTION LENS PROM SCREEN, MASK REING THERE INCIDEN

. 4					0.112.2.02			
	18	ft. in.	31 6 37 6 43 6 49 6	55 6 61 6 67 6 73 6	79 6 85 6 91 6 97 6	109 6 121 6 151 6 181 6	211 6 241 6 271 6 301 6	-
-	91	ft. in.	28 0 33 4 38 8 44 0	54 8 60 0 65 4	70 8 76 0 81 4 86 8	97 4 108 0 134 8 161 4	188 0 214 8 241 4 268 0	
HES.	15	ft. in.	26 3 31 3 36 3 41 3	46 3 51 3 56 3 61 3	66 3 71 3 76 3 81 3	91 3 101 3 126 3 151 3	176 3 201 3 226 3 251 3	
E INCH	14	ft. in.	24 6 29 2 33 10 38 6	43 2 47 10 52 6 57 2	61 10 66 6 71 2 75 10	85 2 94 6 117 10 141 2	164 6 187 10 211 2 234 6	
THRE	12	ft. in.	33 25 23 33 33 33 33 33 33 33 33 33 33 33 33	37 41 45 49	53 57 61 65	73 101 121	141 161 181 201	
K BEING	Ħ	ft. in.	19 3 22 11 26 7 30 3	33 11 37 7 41 3 44 11	48 7 52 3 55 11 59 7	66 11 74 3 92 7 110 11	129 3 147 7 165 11 184 3	
N, MASI	10	ft. in.	17 6 20 10 24 2 27 6	30 10 34 2 37 6 40 10	44 2 47 6 50 10 54 2	60 10 67 6 84 2 00 10	117 6 134 2 150 10 167 6	
SCREE	6	ft. in. f	15 9 21 9 24 9	27 30 33 33 36 9	339 442 99 99 99 99	54 9 60 9 75 9	0000	
IS FROM	00	in.	0 0 4 0	∞40∞	40%4	∞04∞	4 0 105 7 4 120 9 8 135 4 0 150	
ON LED	7	ın. ft.	3 14 7 16 11 19 3 22	7 24 11 27 3 30 7 32	11 35 3 38 7 40 11 43	7 48 3 54 11 67 7 80	3 134 3 134	
OFECTI		in. ft.	6 12 6 14 6 16 6 19	6 23 28 28 28 28 28 28 28 28 28 28 28 28 28	6 33 6 35 6 37 6 37 6 37 6	6 47 6 47 6 58 6 70	6 82 6 93 6 105 6 117	
OF PR	9	ft.	1010101010 0111110101010101010101010101	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	320 88 66 320 88 66	48484848 8 0 0 0 0	100000	
TANCE	27	ft, in.	11 55 11 15	16 115 18 95 20 75 22 55	24 34 26 11 27 111 29 95	33 37 37 37 46 37 37 37 37 37 37 37 37 37 37 37 37 37	64 74 73 94 82 113 92 13	
JICT .	īŌ	ft. in.	8 9 10 5 12 1 13 9	15 5 17 1 18 9 20 5	22 1 23 9 25 5 27 1	30 5 33 9 42 1 50 5	58 9 67 1 75 5 83 9	
	44	ft. in.	7 104 9 44 10 104 12 44	13 101 15 41 16 101 18 41	19 104 22 104 22 103 24 44	27 44 30 44 37 104 45 44	52 105 60 45 67 105 75 45	
	Foci .	Disc.	10000	100	13 14 15 16	18 20 30 30	35 40 45 50	

TABLE OF DISTANCES FOR AN OBJECT OF SIXTY-EIGHT INCHES HEIGHT. COMPUTED BY P. BROSIG.

						1	-				-			
	68													-
	56		- Parisit											
	48		000	quired	100									
	40		0000	oace re	a diameter and a diam								35.1	
	32		in this	ile of sy							34.4	37.5	40.6	
	28		mittod	re wide angle of space requi						34.3	37.7	41.1	18.4	
	24		Value one omitted in this same on account	of the wide angle of space required,						38.3	42.2	16.2	17.6	
ES).	20		Value	0				35.2	39.6	12.9	14.2	52.8	57.2	
HEIGHTS OF IMAGES (INCHES),	16						36.7	9.9	47.2	52.5	57.7	63.0	68-2	
MAGES	14					35.1	41.0	9.6	52.7	58.6	64.4	70.3	76.1	
8 OF I	12					40.0	8.2	53.3	9.01	8.11	73.3	80.0	15.3	_
Нелент	10				39.0	46.8	8.0	62.4	70.2	78.0	85.8	93.6	14.9	
14	∞			38.0	5.6	57.0	7.8	0.94	10.1	95.0	104.5	13.4	123.5	
	9		37.0	49.3	61.7	74.0	9.2	8.7	9.8	23.3	35.7	13.1	14.1	
	4	36.0	54.0	4.5	5.3	08.0	26.0	144.0	9.5	10.08	11.6	12.7	234.0 10	-
		47.3	3.1			(
	-m	1	E.	94.7	118.3	142.0	165-7	189-3	213.0	236-7	260.3	284.0	307-7	
	62	70-0	105-0	140.0	175.0	210-0	245.0	280-0	315-0	350-0	385.0	420-0	455.0	
	Н	138-0	207-0	276-0	345.0	414.0	483.0	552.0	621.0	690.0	759.0	828.0	897.0	
Shoo	LENT E	22	က	4	5	9	-	20	6	10	11	12	13	

		36-0	40.0	44 0 0 0	48.0	52.0	56.0	64.0	72.0	88.0	104.0
	35.4	39.9	36.5	48.7	53.1	57.6	62.0	70.9	79.7	97.4	115.1
	38.7	43.5	48.3	53.2	58.0	62.8	67.7	77.3	87.0	106.3	125·7 88·7
37-8	43.2	48.6	54.0	59.4	38.1	70.2	75.6	86.4	97.2	118.8	140.4
43.7	50.0	56-2	62.5	52.4	75 0	38.2	87.5	1000.0	112.5	137.5	162.5
48.0	54.9	61.7	68.6	75.4	82.3	89.1	39.5	109.7	123.4 50.8	150.9	178.3
53.7	61.3	69.0	76.7	29.8	92.0	35.2	107.3	122-7	138.0	59.6	199-3
9-19	70.4	79.2	88.0	96.8	31.1	114.4	123.2	140.8	158.4	193.6	228.8
73.5	84.0	94.5	105.0	115.5	126.0	136.5	147.0	168.0	189.0	231.0	273.0
82.0	93.7	105.4	117.1	128.9	140.6	152.3	164.0	187.4	210-9	257.7	304.6
93.3	106.7	120.0	133.3	146.7	160.0	173.3	186.7	213-3	240.0	293.3	346.7
109-2	124.8	140.4	156.0	171.6	187.2	202.8	218.4	249.6	280.8	343.2	405-6
133.0	152.0	171.0	199.0	209.0	228.0	247.0	266.0	304.0	342.0	418.0	494.0
172.7	197.3	222.0	246.7	271.3	296.0	320.6	345.3	394.7	444.0	542.7	641.3
252.0	288-0	324.0	360.0	396.0	432.0	468.0	504.0	576.0	58.1	792.0	936.0
331-3	378-7	426-0	473-3	520-7	568.0	615-3	662-7	757-3	852.0	1041	1231 54·3
490-0	560.0	630-0	700.0	770.0	840.0	910-0	980-0	1120	1260	1540	1820 53.5
996.0	1104	1242	1380	1518	16.6	1794	1932	2208 32·5	2484	3036	52.8
14	16	18	20	22	24	26	87	32	36	44	25

This table gives, in inches, the distances from lens to object (greater conjugate focus, upper number) and from lens to ground glass (lesser conjugate focus, lower number) for different heights of images and different lengths of fooi of lenses, when EXAMPLES. the height of object is 68 inches (=average height of man).

Q.—What are the distances between object, lens, and ground glass if the image of a person is to be 8 inches high and a 14 Q.—What is the height of image of a person who is 133 inches distance from lens, when a lens of 14 inches focus is used?

A.—The height of image in this case is 8 inches.

A.—The distance from object to lens will be 133 inches, from lens to ground glass 15.6 inches. inches focus lens is employed?

TABLES OF DISTANCES AT AND BEYOND WHICH ALL OBJECTS ARE IN FOCUS WHEN SHARP FOCUS IS SECURED ON INFINITY.

Focal					R	atio n	narke	d on	Stops					
length of Lens	114	f5·6	f/6	f/7	f/8	f/10	f/11	f/15	f/16	f/20	f/22	f/32	f/44	f/6
in nches.				Num	ber of	feet	after	which	all i	s in fo	eus.			
4 44 45 45 45	33 38 42 47	24 27 30 34	22 25 28 31	19 21 24 27	17 19 21 24	13 15 17 19	12 14 15 17	9 10 11 12	8 10 11 12	7 7 8 9 9	6 7 7 8	4 5 5 6	3 3 4 5	2 2 3 3
5 5 5 5 5 5	52 57 63 68	36 40 45 50	35 38 43 46	30 33 36 38	26 28 31 34	21 23 25 27	19 21 23 25	14 15 17 18	13 14 15 17	10, 11, 12, 13,	10	7	5	9
6 61 63 63	75 81 87 94	54 58 62 67	50 54 58 63	42 46 50 54	38 40 44 47	30 32 35 38	28 29 3? 34	20 22 23 25	19 20 22 24	15 16 17 19	14 15 16 17	9 10 11 12	7 7 8 8	5
7 71 71 71 71	101 109 117 124	72 78 83 90	73 78 83	58 62 64 71	51 54 58 62	40 44 47 50	37 39 42 45	27 29 31 33	25 27 29 31	20 22 24 25	18 20 21 22	12 13 14 15	10	6000
8 81 82 83	132 141 150 156	96 100 104 111	88 94 100 104	76 80 84 89	€8 71 76 78	52 56 60 63	48 51 56 57	36 37 40 42	32 35 38 39	28 29 30 32	24 25 27 29	16 17 19 20		10
9 94 94 98 94 10	168 180 190 197 208	120 127 133 141 148	112 116 125 131 140	96 101 107 113 120	84 90 95 99 104	67 71 75 79 83	61 65 68 72 75	45 47 50 52 55	42 45 47 50 52	34 35 37 39 42	31 32 34 36 38	21 22 24 25 26	15 16 17 18 19	10 11 12 12 13

If sharp focus is secured on any of the distances shown, then, with the stop indicated, all objects are in focus from half the distance focussed on up to infinity.

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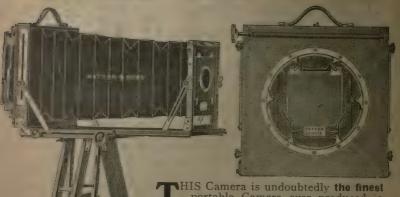
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See following page.

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portable Camera ever produced, a fact which has received recognition at all leading International Exhibitions where it has invariably been given the highest awards.

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It is the Camera par excellence for use in India and all tropical countries. We have received many gratifying letters from customers in all parts of the world testifying to its unique wearing qualities.

It has every movement required in a Camera and will do all that a Camera can do. It has sufficient extension to admit of the use of the single component of convertible Lenses.

For Telephoto Work, or for use with heavy lenses, we supply an Ash strut with two hinged joints to attach between the leg of Tripod and front of "Acme" Camera, adjustable to focus, to maintain perfect rigidity.

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Any item not required may be left out from the Set, and its cost deducted, or single article supplied separately.

· SIZES.	6	6½×4¾		7½×5			8½×6½			10×8			1	2×1	0	15×12		
	£	· s.	d,	£	s.	d.	£	S.	d.	£	S.	d.	£	s.	d.	£	S.	d.
"Acme" Camera and 3 Double Slides	9	12	0	10	0	0	12	5	0	14	0	0	16	12	6	21	0	0
Rotating Turntable in base, and Tripod Stand Series I., "Holostigmat"	2	2	0	2	2	0	2	2	0	2	10	0	2	15	0	3	3	0
Convertible Lens, working at f/6 Solid Leather Travelling	7	5	Đ	8	12	6	9	10	0	14	0	0	18	0	0	24	0	0
Case, with Spring Lock		15	0	1	15	0	2	2	0	2	10	0	3 Th	orni	on-	3 Pi	15 ckar	d
'Koilos" or Compound Diaphragm Shutter	2	8	0		8			14	o	3	0	0			ard O		tter 2	
	23	2	0	24	17	6	28	13	0	36	0	0	41	6	6	53	0	0

If a more rapid lens than f/6'1 is desired, Series 1A f/4'6 should be taken, see page 931.

The following additions may be made to the above Sets-

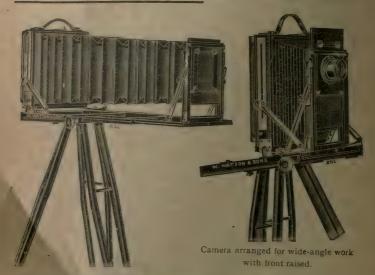
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Brass or Aluminium Binding to Camera and Slides Replacing brass fittings		10	0	1	10	0	1	15	0	2	0	0	2	10	0	3	0	0
to Camera and Slides by Aluminium Telephoto Attachment	2	10	0	2	10	0	3	0	0	3	10	0	4	0	0	4	10	0
for Holostigmat Lens "Holos Convertible" Wide-Augle Lens (see		0	0	3	0	0	3	0	0	1							-	
page 933) Strutsfor use in Telephoto work or for heavy		15	0	4	5	0	4	17	6	5	15	0	7	17	6	9	10	0
Lenses, when used at long extension		7	6	0	7	6	0	7	6	0	7	6	0	10	6	0	10	6

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lens can be brought opposite any part of the plate without interference by the bellows.

3. The back and front of the camera can be brought sufficiently near together to permit of the shortest focus lenses possible for the size of plate being employed,

4. A divided circle is kitted to the inside of the base, reading by a pointer engraved on the turntable. This will be found useful for Panoramic Views.

The extra cost of these additions is as follows :-

For Cameras up to and including $10 \times 8 \not= 2 \quad 0 \quad 0$.. Strut, as page $908 \quad .. \quad 7/6$ 12×10 and $15 \times 12 \quad ... \quad ... \quad f2 \quad 15 \quad 0 \quad ... \quad , \quad ... \quad , \quad ... \quad 10/6$

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For any purpose where lightness and portability are not the chief consideration (when the "Acme" is preferable), these Cameras should be chosen. They are most solidly constructed and their extra weight gives to them the highest degree of steadiness and strength.

This model, which is our original pattern, still holds its position and commands a large sale. It has been extensively imitated but no other pattern has been introduced to equal it for strength, durability and convenience.

The Cameras have double extension to focus, giving a very long range, are adjusted by rackwork or screw (the larger sizes, from 12 by 10 upwards, are always made to adjust by screw), double swinging back, giving motions in horizontal or vertical directions, rising, falling, and sliding fronts (two fronts), leather bellows body, folding baseboard, and reversing frame.

When fitted with a Repeating Back, at the extra cost shown on next page, these Cameras will do all the work required in a Studio, forming a perfect equipment both for indoor and outdoor work for professional photographers.

Included with each Camera is an extra sliding panel for a second lens; all sizes, from $\frac{1}{2}$ -plate to $8\frac{1}{2}$ by $6\frac{1}{2}$, have a movable central partition and wide front, so that they may be used for Stereoscopic Pictures if desired, or two pictures on one plate by sliding the lens across.

For Prices see following page.

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Complete 'Premier' Outfits.

	-							
-	-0	0	100	0	0	0	0	0
15×12	0	0	100	-	9	0	0	9 10
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22	£ s.	8	44	0	41 16	7	60	7
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7.	₩ 2	00		0	22	-	61	4
nske	O.A.	0	00	9	9	0	0	0
63×43	0. Cd	10	រី រ	0 12	20 0	1 10	2 10	4 10
9	40	7	des des	0	20	-	8	4
	Camera and 3 double slides	Lens, working at 1/6	spring lock Soliding Tripod Stand Time and Instantaneous Shutter.	with Speed Indicator and Anti- nous Release		Extra, if Camera and Slides are brass- bound for hot countries Extra for adding repeating back for	portraifure, to take a pictures on one plate, as with a Universal Studio Camera	"Holos Convertible" Wide-Angle Lens (see page 933)

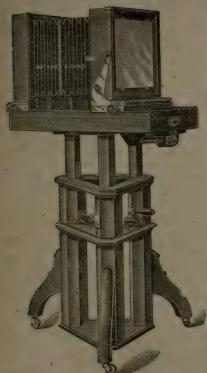
Any item in above estimates may be purchased alone, or left out from the set if desired, and cost deducted

If the addition of Repeating Back is made at time of purchasing Camera, one of the slides (single or double) supplied may be fitted free of cost to use both in this and the ordinary frame, N.B..-These Cameras can be purchased on W. & Sons' progressive payment system spread over a period of twelve months, particulars of which can be had on application.

W. WATSON & SONS, Ltd., 313, High Holborn, London, W.C., AND 16, FORREST ROAD, EDINBURGH

WATSON'S

APPARATUS. COMBINATION STUDIO



Of perfect workmanship.

Made only of seasoned mahogany.

No Veneering.

No Whitewood blacked over.

No Warping.

BRITISH MADE THROUGHOUT.

Fit for any Climate.

One of the best-known professionals in England says :-

"The best investment ever made was one of Combination Apparatus and Holostigmat Lens."

BOURNE & SHEPHERD, BOMBAY.

"We are taking this opportunity of stating that the Camera recently delivered (15×15 Combination, fitted with Screen Gear for process) gives every satisfaction."

CLIFTON & CO., BOMBAY.

"The 15×15 Combination Camera has come safely to hand, and we are exceedingly pleased with it

A. & G. TAYLOR, LONDON, CARDIFF, SWANSEA, ETC.

"We duly received the 15×15 Combination Studio Camera and Stand in sound condition. Needless to say we are more than pleased with it, while our operator is equally delighted."

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

PERFECTION IN STUDIO APPARATUS.

We claim for this Camera and Stand that they are in every detail the most perfect, both as regards utility of movements and workmanship, that have yet been put before the professional photographer.

The base of the Camera and the top of the Stand are screwed permanently one to the other, so that ABSOLUTE RIGIDITY AND FREEDOM FROM VIBRATION are insured. The Camera can be extended both at back and front, giving very long range of focus.

The gearing for raising and lowering the top of the stand is of special design, the teeth of all racks and spindles being machine cut and not cast. The top of the Stand is fitted with

tilting motion, working by an endless screw.

The wood throughout in CAMERA AND STAND is choice mahogany, thoroughly seasoned in our own factory (not white wood blacked over), and the stand is of elegant design and very rigid.

The outfit is a handsome addition to the furniture of any

SPECIFICATION.

A mahogany Camera and Stand as illustrated on preceding page

Rising and falling motion to the front,

Horizontal and vertical swing to the Back. Fine adjustment by Rack and Pinion.

(Special twisted Pinion with spiral racks, obviating backlash).

Best Morocco Leather Bellows.

A single Slide of choice mahogany, for the full size of plate, having flexible Roller Shutter and fitted with Carriers down to 81/2 ×61/2.

A separate Glass Frame for focussing, interchangeable with the same.

A Repeating Holder, fitting alternatively in place of the above Slide, with hinged Glass Frame, and carrying a dark slide 9½ ×6½, taking plates 8½ ×6½, or two ½-plates side by side and fitted with a Carrier to take two ½-plates side by side

Full focus of the Camera (size 12×10), 4ft.

Full height of Stand, 3ft. 7in.

Height of Stand, racked down, 2ft. 6in.

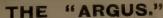
PRICE LIST.

Camera and Stand as per size with Roller Blind-Shutter. Camera and Specification above. 2 Slides 12 X 12 £28 10 £3 15 £3 10 0 15 X 15 3 10

N.B .- Customers resident in this country can purchase on Watson & Sons' Progressive Payment System—spread over a period of 13 months, particulars of which will be

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

Watson's Focal-Plane Reflex Camera.



"We have no word of praise too high for this really beautiful and efficient instrument." The Amateur Photographer.

We submit the following description of our Argus Reflex Camera, confident that our customers will

find it to be a combination of efficiency and workmanship in the highest degree, and fully maintaining our reputation as manufacturers of first-class photographic instruments.

Having an experience of thirty years in the manufacture of photographic Cameras, and being the oldest existent makers of these goods, we have thorcughly assimilated the features necessary to equipment of an up-todate Reflex Camera, and

we claim that the "Argus" fulfils this description, being at the same time free from unnecessary details and elaboration, which, in a general way, merely add to the expense, weight, and

difficulties of manipulation.

The "Argus" fully meets the needs of all classes of photographers, but especially of those whose aim is precise and artistic pictures, and who want to be as sure of their results as if they were using an ordinary Stand Camera, with the added advantages of being able to watch and focus the erect image up to the instant of exposure and to make the exposure at the most opportune

Although more bulky than a Folding Camera, we have reduced the size of the "Argus" to the minimum possible with-

out sacrifice of stability, or good workmanship.

The "Argus" is an ideal Camera and its portability and simplicity commend it strongly to

Press Correspondents (it is in constant use by the principal Newspaper Artists of the London Press). Artists for Genre Studies, Streets Scenes, etc.

Professional Photographers for Local Events. Amateur Photographers for Exhibition Pictures. Naturalists, Sportsmen, Yachtsmen, etc.,

V. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

The "Argus" can be brought into use instantly. It has all the advantages and none of the disadvantages of a Twin lens, as the reflex principle and the simultaneous discharge of the Shutter when the mirror is raised, ensure that the exact image which will appear on the plate, is shown on the finder. One Lens thus suffices instead of two, without the defect common to the Twin Lens system of near objects appearing in a different position in the Finder from that they are found to occupy in the negative.

The Camera is constructed throughout in our own factory under our direct personal supervision, and the greatest care is taken in the selection of all materials used. Every outfit is tested by an experienced Photographer before being sent out, and customers abroad may therefore order with absolute confidence, and the certainty of receiving goods in perfect condition. We guarantee the efficiency and quality of this apparatus, and its ability to stand the hardest fair usage without giving way in any part.

Specification of the "ARGUS" Camera.

The Body of the Camera is made of the best selected Spanish mahogany, carefully seasoned by us for months, and guaranteed to withstand any climatic influence which it is possible for wood to do, each board carefully tongued and clamped where necessary.

It is provided with a bellows extension giving a sufficient range of focus to allow of the use of the single component of the Holostigmat, or other Lens of corresponding length, and the adjustment is made by means of rack and pinion, an extra broad milled head being fitted to the pinion, ensuring rapid and easy working.

The discharging lever is on the opposite side to the focussing knob, so that the Camera can be focussed and discharged simultaneously, and it can be held more steadily than when the two actions are on the same side. It is covered in best black morocco leather, the front and the metal parts being finished black to

render the Camera as unobtrusive as possible.

The Mirror, which is silvered on the surface and brightly polished, reflects the maximum of light. It gives a non-distorted image on the finder in true focal register with the plate. The silvered surface is protected from damp by a transparent coating. The normal position of the Mirror being "down" the image on the finder can be seen right up to and immediately after the exposure, being only obscured during the exposure. The Mirror does not require setting after each exposure.

The Finder shows the full sized image in both directions in the square, and in the horizontal direction in the oblong pattern.

The Hood is of a new folding pattern, and is shaped to fit closely round the eyes. It thoroughly cuts off all outside light from the finder, and rises to an ample height for comfortable focussing. It forms such a total shade that the image can be clearly seen on the finder and focussed in the very brightest light.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

No part of the view is cut off, and the hood is of such a shape as to allow of an unimpeded view of the whole of the finder at one time. The upper part of the Camera body containing the hood and finder cover is hinged, thus giving the user immediate access to the focusing screen for removing dust or replacing the screen in the event of breakage.



of the Camera and the ground glass.)

The Shutter is built into the back of the Camera, and works practically noiseless. It is a new model Focal Plane of the very highest efficiency, having a most comprehensive range of speeds. It will give time exposures of any duration, or instantaneous up to 1200 th of a second, and these can be altered both by varying the tension of the driving spring and the width of the All the mechanism controlling the speed of the shutter both of spring and slit is on the outside of the camera, and it is only necessary to turn a milled head when a different exposure is desired, instead of having to remove the dark slide in order to get at the slit.

The Blind of the "Argus" Shutter is made of carefully selected rubbered cloth of great flexibility and free from pinholes.

For use on a stand, a ground-glass screen fitted with focussing shade is provided, or if preferred, the Reflex finder can be used—either way the focusing cloth can be dispensed with.

. The Reversing Back is made to revolve, and can be relied upon for its accuracy of fitting, ensuring freedom from fogged

plates.

The "Argus" Camera is also supplied in the horizontal shape for taking pictures mainly in the one position, but available for vertical pictures when held in that position.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

The Lens listed with the Camera is our Series I. Holostigmat covering perfectly at 1/6'r (or 1/6's according to No.). which comparative tests, made with all the leading anastigmats, justify us in stating is fully equal in performance to any lens now made, It is convertible and the single components cover the plate perfectly at, their full aperture, 1/11, while they have that remarkable brilliancy of image for which true landscape lenses are noted.

To the square "Argus" we fit 6\(\frac{1}{2}\) in., 7 in. and 8\(\frac{1}{2}\) in. Holostigmats for \(\frac{1}{2}\), 5\times 4 and \(\frac{1}{2}\)-plate respectively, and to the horizontal pattern, 6 in., 6\(\frac{1}{2}\) in. and 7 in. Other Lenses can be supplied or fitted, and they should not only correspond as to focus

Lenses can be supplied of fitted, and they should not only correspond as to focus with the Holostigmat, but be also mounted in sunk fitting.

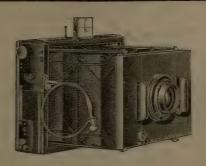
(N.B.—The Series 1A Holostigmat 1/4.6, can also be fitted, the square Camera requiring 6\frac{3}{2} in., 7\frac{1}{2} in. and 8\frac{3}{2} in. for the \frac{1}{2}-plate, 5\times 4 and \frac{1}{2}-plate respectively and the extra cost being \(\xi 4 \) los., \(\xi 6 \) 5s. and \(\xi 8 \) los., beyond that of the Series 1). Price List of "ARGUS" CAMERA

W		An	603	GAMER	A.	
w.	34×24	Finder a	ad Revolu			tereoscopic,
"Argus" Camera,		‡-plate	5×4	51×31	1-plate	63×33
complete with Series I.	t s d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
Holostigmat Lens and 3					2	, J. G.
best Book-form Slides						
Do. do., but with 3	18 10 0	19 15 0	22 15 0	23 12 6	28 0 0	
Calid Cliden	47 47 0					
'Argus' Camera &	17 15 0	18 15 0	21 10 0	22 76	2612 6	
Holostigmat Lens and						
Vril Changing Box (no						
Slides)	10 10 0					
"Argus" Camera &	18 10 0	19 18 0	22 18 0	24 06	28 15 D	_
3 best Slides (no Lens)						
Do., do. and 3 Solid	12 10 0	12 10 D	15 0 0	15 00	18 10 0	
Slides (no Lens)	11 10 0					
Direct (no Della)	11 10 0	11 10 0	13 15 0	13 15 0	17 2 6	
	Ho	rizontal	Pattern			
"Argus" Camera			. accorn			
complete with Series I.						
Holostigmat Lens & 3						
best Book-form Slides		16 10 0	10 00	40 44 5		
Do., do., but with 3		16 10 0	18 60	19 14 0	22 15 0	31 10 0
Solid Slides		15 15 0	17 5 0	40 40 0		
"Argus" Camera &		15 15 0	17 5 0	18 13 0	21 7 6	30 2 6
Holestigmat Lens and						
Vril Changing Box (no.						
Slides)		16 13 0	19 0 0	10 10 0		
Argus" Camera 8		10 10 0	10 9 0	19 18 0	23 10 0	31 10 0
3 best Slides (no Lens)		9 15 0	11 1 0	10 00		
Do., do., and 3 Solid		0 10 0		12 0 0	15 00	18 0 0
Slides (no Lens)		9 0 0	10 0 0	11 00	40.40 0	
Leather Travelling		3 0 0			13 12 6	16 12 6
Case for Camera and 3			Ext	ras.		
Slides, or Changing Boy	1 13 0	1 13 0		1 17 0	0 5 0	
Vril' Changing Boy			1 12 0	1 17 0	2 50	2 5 0
IOI 12 Plates	2 5 0	2 8 0	2 14 0	2 19 0	3 15 0	0 0 0 1
Twenty-four Film			A 14 0 .	2 15 0	3 15 0	3 0 0 ;
Sheatha for same	0 10 0	0 10 0	0 10 0	0 12 0	0 12 0	0.40.0
Houghton Envelope				0 .2 0	0 12 0	0 12 0
Adapter Model B. (for						
Plates and Films)	1	0 15 0	0 18 6	0 18 6	1 5 0	
(Cost of Fitting extra)					. 30	
Three-fold Tripod	1 50	1 5 0	1 5 0	1 5 0	1 5 0	1 5 0
Telephoto Attachment	2 10 0	2 10 0	3 0 0 :	3 0 0	3 0 0	1 5 0
Extra Dark Stides.					- 00	
best Book-form, each	0 16 6	0 16 6	0 18 6	0 18 6	1 16	1 16
Do., Solid Form, each	-	0 10 0	0 10 0	0 10 0	0 12 6	0 12 6
Light Leather Case					- 12	- 12 0
for Camera and 3 Slides						
or Changing Box	1 0 0	1 0 0	1 20	1 2 0	1 7 6	1 776
W. WATSON & SO	NS Itd	212 1	lich Ha	lh own	01100	
	Llu	., 313, F	IIKN MO	DOFF.		W C

and 16, Forrest Road, Edinburgh.

WATSON'S

"Vril" Focal Plane Camera.



This is a delightful companion, as it is so very compact and light that it can be carried anywhere without inconvenience, and as the Shutter gives the inestimable advantage of Time Exposures, as well as the marvellous speed of 1/1200 of a second for quickly moving objects, the Camera is equipped for practically every kind of subject.

As will be seen from the sketch, a falling baseboard is dispensed with, and the front is supported on extending spring arms, which hold it very rigidily. The front can be brought into position almost instantly, and the Camera can be very quickly closed. It is therefore peculiarly valuable for catching unexpected pictures of street scenes, etc., and it can be used on occasions when a more complicated Camera would not be carried.

When not in use the Camera folds quite flat, and measures in \(\frac{1}{2}\)-plate size only 8×7×3, and weighs, complete with Lens, 3\(\frac{1}{2}\)!bs. The front of the Camera has rising motion in both horizontal and vertical directions.

The back portion of the Camera consists of a Focal Plane Shutter of a new designs It gives time exposures (for use on a stand) and a long range of instantaneous speed, from 1/15th to 1/1200th of a second, fitting it not only for landscape work, street scenes, etc., but for the very highest and most exacting kinds of high-speed photography, such as horse racing, athletic meetings, yachting, etc., etc.

One of the most valuable features of this Focal-Plane Shutter is that all the adjustments for varying the speeds are on the outside of the Camera, so that any alteration can be made to the width of Shutter Slit, or to the tension spring, without removing the dark slide or changing box from its position. When it is considered how suddenly the light often changes while the Camera is charged ready for exposure, rendering it necessary to alter the exposure, the great utility of this improvement will be manifest.

An ivory tablet attached to each Camera gives a list of the most useful speeds, and shows how to obtain them.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

The view finder has a levelling pointer and when the eye is brought up close to this the same view (approximately) is seen in the finder as will appear on the plate.

The Lens supplied with it is one of our "Holostigmat" Series I., in focusing mount,

The Camera is covered with black leather, the uncovered parts, namely, the front and focussing frame, being of eboaized mahogany. It presents a handsome and unobtrusive appearance and is certain to prove satisfactory in use.

Price List.

		-pla	te d.		5×4				te d.	9	tere cop	ic
Camera, as described, including 3 double slides, inder and Holo- stigmat Lens in focussing mount with Iris diaphragm		0		`	0				0	20		
Leather case to carry Camera and 3 slides or changing box	0	13	6	0	15	0	0	17	B	0	17	6
"Vril" changing box to hold 12 plates	2	8	0	2	14	0	3	15	0	3	0	0
24 Film Sheaths	0	10	0	0	10	ø	0	12	0	0	12	0
Ebonized Wood Tripod, very firm, folding and adjustable	0	18	6	0	18	6	0	18	6	0	18	6
Extension to back of Camera, permitting the use of the back compoment of the Holostigmat as a lens of long focus	2	0	0	2	5	0	2	15	o	2	15	0
"Antinous" Shutter Release	0	4	0	0	4	0	0	4	0	0	4	0
Camera as described, with 3 double slides and finder only	5	15	0	6	0	0	7	10	0	7	10	0
Extra Double Slides	0	10	0	0	10	0	0	12	6	0	12	6
Film Pack Adapter	0	9	0	0	10	0		_				

N.B.—A time arrangement for giving automatically timed exposures of 1/8 th to r second can be fitted in the 5×4 and 1-plate sizes at an extra cost of 30/-

Telephoto Attachment.

The utility of the "Vril" Camera is greatly increased by the addition of our new Telephoto Negative Lens.

This dens enables the user to obtain an image just double the size of that given with the normal lens, and has been so arranged that the ordinary lens can be attached to the telephoto mount, the focussing adjustment and scale of distances being used as before,

Prices - 1-plate and 5×4 sizes, (2 5 0; 1-plate, £2 10 0

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C.

Watson's "ALPHA" Camera. DE LUXE 1909 MODEL.



Camera showing Swing Movement of Front.

This Camera combines in its movements all that is required in an apparatus specially designed for use on a Tripod with the essentials of a perfect Hand Camera.
It is self-contained, the

whole of the fittings, Lens, Shutter and Finder being enclosed within the thickness of the Camera body while the base when closed, up makes a perfect protection for all.

In the construction of the Camera we have spe-cially considered and provided for Portrait and Landscape Photography. Interior work with Lenses of very wide angle and Telephotography, and for all these

purposes it will be found to be scientifically perfect, without the introduction of complicated movements.

The Alpha De Luxe will be found to Combine utility with simplicity of design.

Specification.

A well seasoned mahogany Camera covered with leather, and with external metal fittings finished black, making an unobtrusive whole.

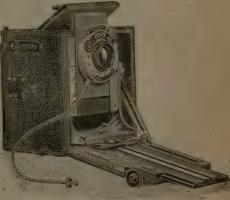
Extension is obtained by drawing the front forward and by racking out the base, and is of sufficient length to allow of using the single components of Convertible Lenses. Swing Movement is provided

both to the Back and Front of the

Rising Front. A very great amount of rise is obtained, as not only does the Lens panel rise, but also the main Front itself.

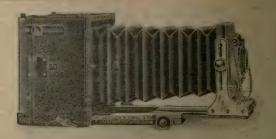
Reversing Back is provided, so that pictures can be taken in either horizontal or vertical positions without movement of the Camera.

Wide-Angle Work can be done with the Camera, and a separate rack and pinion motion is provided, so that Lenses of very short focus working inside the Camera body can be accurately adjusted, and the base of the Camera being dropped out of the horizontal plane, there is no interference with the angle of view.



Camera arranged for Wide-Angle Work.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.



Camera showing full extension of Bellows.

The Finder is of a type giving a brilliant image, clearly visible in the strongest right, and embracing an angle of view approximately the same as the Lens. It has a leversible mask, showing the picture in either horizontal or vertical positions.

Level of Circular form is fitted to the Camera.

Focussing is effected by rack and pinion motion, and the teeth being cut diagonally, give a perfecty smooth movement, free from play.

Scales of Distances for automatically focussing either the combined Lens or its single component, and Infinity Stops are provided when the Camera is ordered complete with Holostigmat or other Lens.

For Use in the Tropics we can specially recommend this Camera, both on account of the strength of its construction, and the thoroughly seasoned condition of the materials used.

PIIC	e List.		5×4				
Camera as described with three Double Slides and Finder			Post-Ca	rđ.	₫-plat £10 17		
Extra Rack and Pinion Focussing Adjustment for use with Wide-Angle Lens	0 15	o	0 15	0	0 15	0	
Holostigmat Lens f/6, fitted to Compound or Koilos Shutter with Antinous Release.	7 5	0	8 7	6	9 13	0	
Vril Changing Box to hold 12 plates	2 8	0	2 14	0	3 15	0	
Solid Leather Case with Lock and Key	1 10	0	1 10	0	1 16	0	
Extra cost of brass binding the three Double Slides when Camera is required for use abroad	0 10	6	0 10	6	0 10	6	

Post Card size Changing Box costs 5/- extra.

For High-Speed Work, such as Sports, Street Scenes, etc., we recommend the addition of a Focal Plane Shutter. This is adapted to fit into the back of the Camera, in place of the ordinary Reversing Back, and is detachable.

it has a range of Speeds up to $\frac{1}{1500}$ th of a second.

	Prices.	
3-plate.	.5×4	-plate.
£2 10 0	£2 17 6	£3 12 6
	Fitting extra.	

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

OLYMPIC SPORTS, JULY, 1908.—POLE JUMP.



Negative by London News Agency.

Taken with Watson's Series la Holostigmat Lens, 83 in. focus, aperture f/8. exposure 1/800th of a Second on 3-plate "Argus" Focal Plane Rellex Camera.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C.;



W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C.; 16, Forrest Road, Edinburgh; and 2, Easy Row, Birmingham.



Reduced from a Negative taken with 7-in. Lens on Whole Plate, f/16.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C.; 16, Forrest Road, Edinburgh; and 2, Easy Row, Birmingham.



W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C.; 16, Forrest Road, Edinburgh; and 2, Easy Row, Birmingham.

THE STEREOSCOPIC BINOCULAR CAMERA.



This is held to the eyes like a Binocular Glass, which in appearance it resembles, but its unique feature is that the picture is taken at right angles to the direction in which the camera is ostensibly pointed, and in this way it secures pictures without in any way indicating its purpose. It is an ideal Detective Camera and invaluable to travellers, as it enables them to catch native subjects in perfectly natural poses, without arousing any suspicions in their minds that they are being photographed.

The Camera is made entirely of metal, and can therefore be carried in the most

trying climates with every confidence that it will not get out of order.

It is fitted with a pair of R.R. Lenses giving perfect definition, and the shutter works from 1/25th to 1/80th of a second, in addition to time exposures. The view is seen works from 1/25th to spouth of a section, in a finder fitted to one of the eyepieces.

The Changing Box which, in position, occupies one of the itubular bodies of the camera, carries 12 plates 41 × 2, on which Stereoscopic views are taken, or by obscuring one of the lenses 24 single pictures may be secured.

The stereo pictures when viewed in a Stereoscope stand out in remarkable relief.

The stereo pictures when viewed in a Stereoscope stand out in remarkable relief.

presenting the view with astonishing reality—in fact no more fascinating entertainment could be offered than the viewing-of a series of these transparencies or pictures in the

pedestar or hand Stereoscopes risted below.			
PRICE LIST:			
Stereoscopic "Binocular" Camera, fitted with pair of first quality Rapid			
Rectilinear Lenses, and with sling case complete	11	11	0
Extra cost if fitted with Zeiss Lenses	8		Ö
Extra Magazine, with 12 carriers and aluminium curtain-this can be inserted			
in daylight	3	15	0
Lurnière Plates, coated on extra thin glass, per dozen	ō		ŏ
Transparency Plates, for Positives, per dozen	Ö	-1	3
Printing Frame for making Stereoscopic Transparencies without having to			
divide and remount them	0	6	6
Hand Stereoscope, best quality, for viewing Positives, with focussing			
draw tubes (1201)	0	16	6
Ditto, ditto, with adjustment to width of evepieces (1215)	1	7	6
Rosewood Pedestal Stereoscope with revolving chain to take 50 views (paper			
or glass) with rackwork focussing and adjustment to width of eyes, very			
handsome (No-1445)	4	10	0
Knlarging Apparatus to enlarge to full stereoscopic size (61 × 31)	4	0	0
Set of 3 enamelled iron Washing Tanks (nesting) labelled Developer, Alum,			
Hypo, each with rack to hold 12 plates	1	1	10
Negative Boxes for 24 stereo, negatives	0	4	0
Film Sheaths, per set (24)	0	14	0
Extra Plate Sheaths, per dozen	0	7	0
	_		

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16. Forrest Road, Edinburgh,

The 'Empire' Hand Camera.



The "Empire" Hand Camera has been specially designed by a well-known photographer, who has considerable experience of the conditions under which photography is carried on in the Tropics. The aim throughout has been to produce an instrument capable of permanently withstanding extreme climatic variations, and at the same time calculated to afford to the pictorial and scientific photographer every facility which can reasonably be expected of a Camera specially built for hard wear and tear under the severest of all conditions. Every point has been carefully studied—and, where necessary, modified—from the design of a specimen Camera, which has been manipulated by an expert in a recent tour of several thousand miles in both tropical and temperate climates.

DESCRIPTION OF THE 'EMPIRE' HAND CAMERA.

(\frac{1}{4}\text{-plate size}).

The Lens ordinarily supplied and recommended for use with the "Empire" Hand Camera is Watson's Convertible Holostigmat No. 5, having a combined focus of 5½ inches and an aperture of 1/6.5; the front and back components being of 10½ and 8½ inch foci respectively, and working at an aperture of f/11.5.

foci respectively, and working at an aperture of f/11.5.

The Shutter is the Bausch & Lomb Unicum, giving exposures of 1/100th, 1/25th, 1/5th, 1/25th, 1/25th,

for use under all conditions.

The Woodwork is of the very best manageny throughout, of the same quality which has so successfully stood the test of time in our Acme Cameras for such a number of years. The whole of the woodwork is clamped and cross-tongued, and all joints are

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

Description of the 'Empire' Hand Camera-Continued, screwed together, which renders the Camera proof against the

The Dark Slides, of which three are included in the price of each Camera, are of best quality and of the book-form double type, which for hard and long wear cannot be equalled by any of the newer patterns.

An isochromatic Screen, fitted to screw on to the front lens

cell, is supplied free with each Camera.

Rising and Cross Fronts are fitted, giving a large range of

movement in either direction.

The Camera Extension is sufficient to admit of the use of the 101 inch component of the Lens, and a focussing scale is provided for use with that Single Lens, as well as one for the 5½ inch combined Lens. The front draws out with great sweetness and precision of movement, and automatically locks itself into "infinity focus" for the combined Lens, unless specially adjusted for any other distance.

The Bellows is of the best Morocco leather.

The Finder is of the brilliant type, and is accurately adjusted

for both vertical and horizontal pictures.

Two Spirit Levels, sunk flush with the leather work of the Camera, and screw sockets for attaching the Camera to a stand, are also provided.

Size.—The outside dimensions of the Camera when closed are

6½ x 4½ x 2¾ inches, and the weight is 2 lbs. 3 ozs.

The Case is of leather, and holds the Camera, Focussing

Screen, and three Double Dark Slides.

The Focussing Screen is covered by a neat shade, which facilitates focussing when in use, and folds flat, protecting the

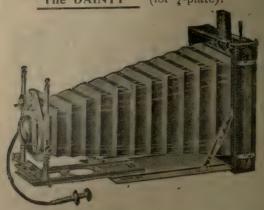
ground-glass screen when travelling,

Fittings.—The Camera is neatly covered with Morocco leather, which is undoubtedly the best wearing material that can be used, and all metal work is of brass. Wherever possible in the making of this Camera screwing has been resorted to in addition to the usual glueing of all jointed parts.

PRICE LIST.		
"Empire" Camera with Holostigmat Lens, three		
Double Dark Slides, Isochromatic Screen,		
and Leather Case, Nett Cash	£12 12	2 0
"Empire" Camera, with Rapid Rectilinear Lens and		
Film Pack Adapter, only	7 8	
EXTRAS.		
Specially made leather-covered Film Pack Adapter,		
made to interchange with the Slides	0 10	
Aluminium Tripod, height extended, 48 inches;		
closed, 14 inches; weight, 14 ozs., with revolving		
top	1 7	7 6
Extra Double Dark Slides, each	0 15	0

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16. Forrest Road, Edinburgh,

New Folding Pocket Camera. "The DAINTY" (for \frac{1}{2}-plate).



Measurement, $6 \times 4\frac{1}{2} \times 1\frac{1}{4}$ (goes easily into the pocket). Weight, complete with Lens and Shutter, 1 lb. 11 oz.

We can strongly recommend this apparatus to customers who desire to have a Camera of the greatest possible compactness combined with efficiency. It is beautifully made throughout. The body is of mahogany, leather-covered, front and base being of

aluminium

Rising and sliding motions are fitted to the front, and double etxension by rackwork provides a sufficient range of focus for the use of single component of Anastigmat Lenses. An exceedingly thin Sector Shutter fitted with a Holostigmat Lens, aperture f/6.1, is supplied with this Camera, also Finder for use in either horizontal or vertical positions. The Focussing Screen is provided with a leather collapsible covering which serves as an efficient shade when focussing objects on the ground glass, but divided scales are also provided, which enable the user to dispense with focussing in the ordinary way when desired. The finder springs into position when the Camera is opened and closes automatically as it is shut up.

PRICE LIST.

Camera complete with Aplanat Lens and Shutter, as above described, including six metal slides (or three slides and film adapter)

Extra for Holostigmat, Series I. Lens, instead of Aplanat Lens

£5 5 0

5 15 0

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

PRICE LIST of the

"Holostigmat" Convertible Lens. Series la.



The Quickest

Convertible Doublet

made,

and the best for

Autochrome

Photography.

8 w The important advantages which this new Lens confers over all others should be carefully considered in the choice of a new instrument.

It is the only Lens among the extremely rapid Anastigmats which is a true doublet. The advantage of this is that it yields an image of the greatest brilliancy free from that hazy appearance caused by doubly reflected light, so characteristic of negatives taken by Lenses made up of separated components.

Moroever, among all the modern Lenses of extreme rapidity this is the only one which is truly convertible. The single components are so well corrected as to be suitable for use at their full aperture f/8·5 a performance which has never before been achieved.

The aperture remains constant; the holo-symmetrical (2 foci) working at $f/4^{\circ}6$ and the hemi-symmetrical (3 foci) at $f/4^{\circ}8$, right through the series, permitting of the use of Colour Screens even with very quick exposures, and rendering it the best Lens obtainable for Autochrome Colour Photography.

No.	Focus of Front.	f of Combined Recom-		of of Back. Focus. mended for Price.							
2 3 4 5 6 7 8 9 10	78 81 81 10 10 10 12 12 141 17 17	7 to 7 to 8 to 10 to 12 to 14 to 17	4455665667888888888888888888888888888888	-plate 5×4 -plate -plate	#6 15 0 7 5 0 7 15 0 8 12 6 9 10 0 11 15 0 14 0 0 18 0 0 18 0 0 21 0 0 24 0 0	£1 0 0 1 0 0 1 0 0 1 0 0 1 0 0					

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

Watson's 'Holostigmat' Convertible Lens.

Series 1., f/6·1.



Perfect Correction.

Made of Cemented components, thus giving the maximum shadow detail.

Really Convertible.

The single components cover perfectly at f/II.5.

				-			F 1 C A
No.	Single Apertur	Lenses. e f/11'5. Focus of	Com- bined Focus.	Working Aperture.	Size of Plate.	Prices with Iris Diaphragms.	for Focussing Mount.
	Focus of Front.	Back.	1 000031				
1 2 3 4 56 7 8 9 10 11 12 13 14 15 16 17 18	29 29	Ins. 6 744 744 812 812 104 104 1124 1124 1142 1142 1174 2012 244 29 29	Ins. 4 44 44 45 5 55 66 62 7 7 7 8 9 10 11 12 13 14 15 17 18 20	f/6.5 f/6.1 f/6.5 f/6.1 f/6.5 f/6.1 f/6.5 f/6.1 f/6.5 f/6.1 f/6.5 f/6.1 f/6.5 f/6.1	117 × 14	5 10 0 6 0 0 6 7 6 6 15 0 7 15 0 8 12 6 9 10 0 11 15 0 14 0 0 18 0 0 21 0 0 21 0 0 22 0 0 3 3 0 0	
20	342	34½		1 31-1		- mie moei	. 9/0

Extra cost of pairing 2 Lenses for stereoscopic work, 8/0.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.G. and 16, Forrest Road, Edinburgh.

A New Lens.

The "Holos Convertible " Wide-Angle Lens.



This is an anastigmat of wonderfully uniform correction over a very large part of its field, the full extent of which reaches approximately 110°. Like all other wide-angle lenses it is not completely free from spherical aberration; the correction is, however, such that it can be used for many purposes at f/11. whilst at f/16 it should satisfy the most exacting photographer. The single components form excellent wide-angle landscape lenses working at f/16 or less; their most striking property is an absolutely uniform definition over a plate the length of which considerably exceeds the focus of the lens.

This lens thus represents a Convertible Wide-Angle Lens and we should advise the choice of a doublet to cover the widest angle likely to be required, so that the components may be used as a medium or narrow-angle for less difficult subjects. Even the single lenses are quite rapid enough for "snapshots" in reason-

ably good light.

It will be noticed that a given plate can be covered with an extremely short focus, but as the results are rarely pleasing, owing to the exaggerated perspective, the use of such a short focus is not recommended. A sin. focus on a half-plate and others in proportion will, however, answer the purpose in most cases without giving a too violent perspective.

	nu	109 COULECT	Die Wine	Aligic.	
No.	Front.	Back.	Combined.	Capable of Covering.	Prices.
2 3 4 5 6 7 8 9	5% in. 6¼ ,, 6¼ ,, 8 ,, 9½ ,, 11⅓ ,, 11⅓ ,, 13½ ,,	52 in. 52 52 64 62 8 92 91 113 113 132	3'25ins. 3'5 ,, 3'9 ,, 4'2 ,, 4'6 ,, 5'0 ,, 6'0 ,, 6'5 ,, 7'0 ,, 7'7 ,,	$6\frac{1}{2} \times 4\frac{3}{4}$ $-\frac{8\frac{1}{2} \times 6\frac{1}{2}}{10 \times 8}$ $-\frac{12 \times 10}{12 \times 10}$	s. d. 3 7 6 3 15 0 4 0 0 4 10 0 4 17 6 5 5 0 5 15 0 6 7 6 7 17 6 9 10 0

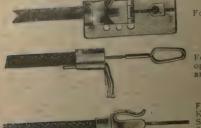
W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

The Watson Patent

utter Release. "Antinous

MPERISHABLE, Efficient and Reliable. Rubber Releases Superseded.

Illustrations (full size) of the patterns principally in demand, with particulars of the best-known Cameras and Shutters to which they can be fitted.



For Thornton Pickard and other makes of roller-blind Shutter.

For cameras with projecting trigger, operated by pull-down movement, and all Shutters that require to be similarly operated.

For Bausch & Lomb, Wollensak, Kodak and latest pattern compound Shutters, and for diaphragm Shutters, fitted with cylinder as supplied with Ensign, Tudor, Kodak, Carbine Wizard, Falloroll, and many other Cameras.



For Koilos Shutters.



For Spido and Block Note Cameras.



For Goerz Sector and Zeiss Linhof





For Compound Shutters.

The Release for small holding Cameras is 9 inches long. The length of the Standard Release is 24 inches. Price 2/6.

Extra long Releases of ordinary patterns can be supplied to order. Prices-6 feet, 5/-; 10 feet, 8/-.

Releases suitable for Watson's Vril, Adam's Videx and N. & G. Cameras are also supplied.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forres Road, Edinburgh.

"Antinous" Shutter Release

For STUDIO SHUTTERS.

REMEMBER. When you have purchased one of these your outlay is ended. The "Antinous" is imperishable, and there is no after-expense for renewals.

NEW MODEL. FOR "SILENT" SHUTTER.



1. The above illustration shows the well-known "Silent" Hemispherical Shutter with the Release attached in both open and closed positions.

The attachment is made by means of a metal bracket which

can readily be adapted to the Shutter in a few minutes.

PRICE LIST. The "Silent" Shutter complete, with "Antinous" Release, 6 ft. long.

3in. opening £1 6 0 $4\frac{3}{4}$ in. opening £1 13 6 $6\frac{1}{4}$ in. opening £2 3 6 4in. , 1 8 6 $5\frac{1}{2}$ in. , 1 18 6 8in. , 2 7 6 (Extra cost if Release is 8 ft. long, 1/6; 10 ft., 3/0; 12 ft. 4/6.) "Antinous" Release only, 6 ft. long, 8/6; 8 ft. long, 10/0; 10 ft. long, 11/6; 12 ft. long, 13/0.

"Antinous" Release for GUERRY SHUTTER.
6 ft. long, 6/0; 8 ft. long, 7/6; 10 ft. long, 9/0; 12 ft. long, 10/6.
"Antinous" Release for Thornton Pickard STUDIO Shutter.



W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

WATSON'S "De Luxe" Enlarging Lantern.



The body and base are of handsome Spanish Mahogany, the former being lined with Russian Iron. It is therefore cool and comfortable to handle. The angles of the with Russian from the interested cool and comfortable to handle. The angles of the ironwork are copper bound, giving the Lantern a very stylish and handsome appearance. The bellows are of Morocco Leather and the brass metal parts are well lacquered and

of the highest finish. To get the best results and the most enjoyment from the use of an Enlarging Lantern, To get the best results and the most enjoyment from the use of an Enlarging Lantern, ease of manipulation is a very essential feature, and in this pattern it is provided in the highest degree. The front is extended on very substantial tubes to approximately the highest degree. The front is extended on very substantial tubes to approximately the correct distance and the final adjustment made by a focusing rack actuating the supplementary front on which the Lens is carried. This is a vast improvement over the usual method of extension, as in addition to being much quicker, there is less strain on the carrying tubes and no wobbling of the picture on the easel during focussing. The position of the light to the Condenser is also adjusted by rack work, a convenience which those who have tried the usual method will appreciate.

We have still further perfected this Lantern by the addition of a Swinging Negative Carrier by which untrue marginal lines in the negative can be corrected in the colargement.

Carrier by which untrue marginal lines in the negative can be corrected in the enlargement.

PRICES. Complete with Oil or Vril Spirit Lamp or Incandescent Gas. Whole-plate 1-plate 63 in. Condenser. 81 in. Condenser. 5½in. Condenser. With Holostigmat £37 10 0 €22 10 0 £16 15 0 Lens Series I £14 15 With large aperture enlarging Lens with rack 25 10 0 and pinion Lantern only (no 13 10 0 Where Electric supply is obtainable we strongly recommend the "Kama" Nernst Electric Lamp, made in three sizes, which can be supplied with the above (in lieu of oil lamp or Vril Spirit Lamp) at the following extra cost No. r for 1-plate and 5×4 (35 to 60 c.p. according to voltage)

"2 for 1-plate (300 to 500 c.p. """)

"3 "" (500 to 1000 c.p. """) 35/-

(about 1000 c.p. on 200 volt current) W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

4-plate

Condenser)

Popular Enlarging Lantern.



The wood work is of well-seasoned mahogany, the body of Russian iron, and the condenser is of first-rate quality, in ventilated mount. Leather bellows.

(6% in.

The lantern focusses y rack and pinion operated from either side and the negative carrier has central swing for correcting untrue lines

For use with electric arc, or oxy-hydrogen light the lantern is supplied with square body, round top and oval cowl, at the above prices, but without illuminant.

WATSON'S

The safest, most brilliant, and most compact Spirit

Lamp made.

Simplicity itself. No fear of exploding or catching

The spirit is contained in the reservoir forming the base of the lamp and is vaporised by a small flame heating the chamber shown on the top of the lamp.
The light is under absolute control, and is regulated simply by raising and lowering the wick exactly as

The lamp burns with absolute steadiness in the Lantern and lasts without trimming about 2 hours. It gives a powerful light equal to incandescent gas and is admirably suited for all optical lanterns. It measures only $6 \times 4\frac{1}{2}$ and 9 inches high so that it easily goes into any ordinary lantern.

PRICE (complete with Tray) 17/6.



W. WATSON & SONS, Ltd., 313, High Helborn, LONDON, W.C. and 16, Forrest Road, Edinburgh,

Watson's Daylight Enlargers.

For 1-plate and 5×4 Negatives (Glass or Film.)



These are made of Mahogany and when not in use fold up into very small compass. The negative carrier and the Lens are rigidly supported at the correct distances by side wings, and the negative carrier is marked for the different sizes. The marked for the different sizes. The apparatus can be erected for use of an instant. You have simply to pull out the negative carrier to the bar marked with the size of the enlargement you wish to make, set the focus to correspond and place the negative and branch services are the size of the s

and bromide paper in position.

The enlargers give whole-plate or 10×8 pictures at will. They are most carefully focussed and are guaranteed to give enlargements of

Prices complete with Lens.

Watson's Special Daylight Enlarger For Half-Plate Negatives.

Made of mahogany, with

bellows extension. For 1-plate glass or film negatives, to whole-plate, 10 × 8 and 12 × 10. The Enlarger is ready focussed and is complete with a dark slide, so that there is no need to carry the Enlarger itself into the dark-room between each exposure. The paper is kept in position by a sheet of glass;



OPEN. there is no necessity to pin it, and there is therefore less liability of finger marks. The Enlarger is exceedingly convenient and portable; dimensions over all when closed

16 in. × 13 in. × 81 in.

.... 24 0 0 PRICE, with Lens complete, without Lens

Any Lens of not more than 8 in. focus can be fitted to this Enlarger. Cost of adapting same and supplying flange is 7/8 extra.

This Enlarger can also be adapted for 1-plate and 5×4 negatives by the addition of a Lens of shorter focus, costing 10/6 extra, and Negative Carriers 2/- each.

"Uniol" Developer per 20 oz. bottle, 1/3. (Strongly recommended),

Magnesium Ribbon, 2/- per oz.; 1/- per 1/2.

The above Prices are net for Cash with Order.

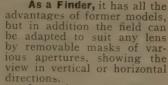
W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

WATSON'S

New Combined Finder, Level and Telemeter.

This instrument is based on a new principle and gives in itself the results which could hitherto only be obtained by the use of three separate instruments.

It is therefore a Finder, a Level and a Telemeter.



It can be used at the eye level or, by a removable mirror, the view is seen by looking down on the finder

ing down on the finder.

As a Level, it is perfect.
The slightest depression or elevation of the camera, or the least tilt to right or left is instantly noticed; and all the while the view is being regarded. Thus the levelling insensibly plays its part in the composition of the picture.

As a Telemeter, it removes

the prime cause of failure in ordinary hand camera work.

It shows instantly the distance of any principal object and thus ensures its being sharply focussed.

In a word it removes all need of failure or loss of time

through having to first consult the Finder and then the Level, and often without success, of endeavouring to estimate the distance for which to set the focus. Price, 15/0 net.

Watson & Sons' Tripods.



Best Sliding Leg Stand, suitable for heavy Cameras up to 15×12, made of Ash, with to in. mahogany top Ditto, ditto, heavier and with 12 in stop ... 2 10 Very Strong Ash Stand, solid legs, with large triangle top, suitable for cameras Brass Telescopic Tripod, 3 section, outside black, very strong and rigid. with revolving top, practically a turntable 0 12 6 Aluminium Tripod, height extended 59in. closed 164 in., weight 14 oz., with revolving top, practically a turntable fitting to camera, a great convenience 1 10 0 Ditto, ditto, height extended, 48 in.,

New Stereoscopic Printing Frame.





Made to take the Stereo sized Negative (61×31) and to Transpose the position of the pictures, thus obviating the necessity of cutting the print or transparency.

In Pine, best quality. Price 5/- each.

WATSON'S ELECTRIC BICHROME LAMP

Is made to suspend by a hook from shelf or ceiling. consists of two bell glasses, the space between them being filled with Bichrome liquid, and both secured by screw top. Where electric current is available we recommend the adoption of this pattern in preference to Gas or Oil. Price complete fitted with 8-c.p. Lamp and Plug.

Fig. 2. 21/-

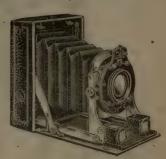
100 Volts unless otherwise ordered.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

Watson's Bébé Camera.

A Veritable Vest Pocket Camera.

For Plates, $1\frac{3}{4} \times 2\frac{5}{16}$ inches (Block Note).



This is one of the smallest and neatest Cameras made and is instantly ready for use, the Lens-board taking up its place at infinity immediately the spring is pressed. Nearer distances than infinity can be focussed by a small lever which is automatically displaced when the Camera is closed.

The Camera is made entirely of metal and covered with best leather. It is complete with double brilliant finder, focussing screen and hood, and three single metal dark slides.

The Lens is an Aplanat f6.8, giving exquisitely sharp negatives which will bear very considerable enlarging.

The Shutter gives Time, Bulb and Instantaneous Exposures of 1, $\frac{1}{2}$, $\frac{1}{25}$, $\frac{1}{50}$ and $\frac{1}{100}$ of a second.

Price, as described with Focussing Adjustment for varying distances	£3	5	0
" without Focussing Adjustment	2	15	0
canging Box to take six plates or 12 films	1	16	0
12 Film Sheaths, 4/- extra. Extra Slides each		1	4

Special Fixed Focus Daylight Enlarger, complete with Lens to take the above Negatives, 15/-.

W. WATSON & SONS, Ltd., 313, High Holborn, LONDON, W.C. and 16, Forrest Road, Edinburgh.

Watson's Astronomical Telescopes.

The year 1910 is one of exceptional interest to amateur astronomers on account of the re-appearance of

HALLEYS'

which has not been seen for 64 years, and will not be visible again for 71 years:

In order to fully appreciate the interest of this historical

comet a telescope is necessary.

It is computed by Sir Robert Ball that 3,000 stars are visible with the naked eye, whereas 324,000 can be seen with a Watson 3in. Telescope.



WATSON'S EDUCATIONAL TELESCOPE

With an astronomical and day eyepiece costs

WATSON'S CENTURY **TELESCOPES**

Are fitted with the celebrated

WATSON CONRADY OBJECTIVES.

WATSON'S "CENTURY" TELESCOPE.

WATSON'S TELESCOPES are

British made by British Workmen at a British Factory. These Telescopes may be purchased by progressive payments.

W. WATSON & SONS, (Opticians to H.M. Government),

313, High Holborn, LONDON, And 16, Forrest Road, EDINBURGH.

Optical Works:-BELL'S HILL, HIGH BARNET.

(See preceding pages.)

THE . . .

LONDON STEREOSCOPIC COMPANY

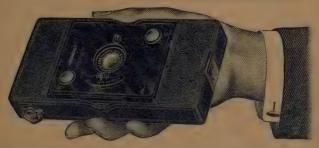
ARE

the LEADING SPECIALISTS in HIGH-CLASS CAMERAS and PHOTOGRAPHIC APPARATUS.

ESTABLISHED OVER 60 YEARS.

A REAL POCKET CAMERA OF EXQUISITE WORKMANSHIP IS THE COMPANY'S

NEW "PARVEX."



The "Parvex" Camera is specially designed and constructed for those who require a really high-class Roll Film Camera, small enough to be easily carried in the pocket, and yet capable of producing photographs of a fair size without enlarging.

Size of camera closed, $6\frac{1}{2} \times 3\frac{1}{4} \times 1\frac{1}{4}$ inches. Size of picture produced, $3\frac{1}{4} \times 2\frac{1}{4}$. Supplied fitted with Goerz, Zeiss or Cooke Lenses.

FINEST BRITISH MANUFACTURE THROUGHOUT.

Fully illustrated booklet free on application from The

LONDON STEREOSCOPIC COMPANY, 106 & 108 Regent Street, London, W.

THE MOST PERFECT AND RELIABLE REFLEX CAMERA MADE IS The Stereoscopic Company's "ARTIST"



Tropical Model "Artist" Reflex, in Polished Teak.

The "Artist" Reflex is by far the most popular of all high - class Reflecting Cameras and possesses every necessary movement.

25

Finest British Manufacture throughout.

Supplied in 3 sizes, in Mahogany (covered in fine morocco leather) or polished Teakwood, brass bound for use in tropical countries.

Each Model is fitted with finest Russia leather Bellows and Focussing Hood, also a Reflecting Mirror is supplied for use when taking photographs from the line of sight.

Fully illustrated booklet sent free on application to The

LONDON STEREOSCOPIC COMPANY.

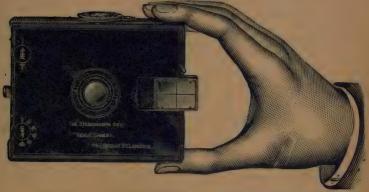
106 & 108 Regent Street, London, W

THE SMALLEST AND LIGHTEST PRACTICAL CAMERA MADE IS

The Stereoscopic Company's "VESCA."

A real Vest Pocket Camera of Exquisite Workmanship.

DAYLIGHT LOADING—FILMS OR PLATES.



The Company's New "Yesca" Camera is no larger than a Gentleman's Cigarette Case and yet produces exquisite photographs of any subject capable of being enlarged afterwards to practically any size without any appreciable loss of definition.

The "Vesca" Camera is fitted with a Goerz Dagor Lens working at F/6'8, and is provided with an Air Brake Shutter giving exposures from $\frac{1}{2}$ sec. to 1/100th, also time.

The "Vesca" Camera is made in Light Metal throughout and covered in the finest Russian Leather. Supplied complete with 6 Slides, in purse cases, at 10 Guineas.

Fully illustrated booklet free on application to The

LONDON STEREOSCOPIC COMPANY, 106 & 108 Regent Street, London, W.

The Finest Roll Film Cameras made

are THE STEREOSCOPIC COMPANY'S

"KING'S OWN.



The Company's "King's Own" Series of Cameras are made up in Polished Teakwood, brass bound. and appeal to all who appreciate exquisite workmanship and de-

Supplied in 5 sizes.

Daylight Loading— Films or Plates.

THE STEREOSCOPIC COMPANY'S NEW

"PRISMA" BINOCULARS



Are the most perfect Field Glasses made for all purposes. Supplied in six powers with a magnification of 6 to 18 diameters.

Prisms can be cleaned by the user. PRICE, complete in Sling Case, from £8:7:6.

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LONDON STEREOSCOPIC COMPANY, 106 & 108 Regent Street, London, W.

"FALLOWFIELD"

A Photographic Name of Reputation for 50 years.

CENTRAL .

PHOTOGRAPHIC STORES,

146 Charing Cross Rd., London, W. Telephone - 4443 CENTRAL. Telegrams - "FALLOWFIELD, LONDON."

"Fallowfield's started with Photography over 50 years ago and has kept pace with it ever since."

EXPORT, WHOLESALE AND RETAIL.

Stand Cameras and Lenses.
Hand Cameras and Tripods.
Lenses of all descriptions.
Mounts and Cards.
Dry Plates, Films and Papers.
Chemicals and Sundries.
Colour Photography.

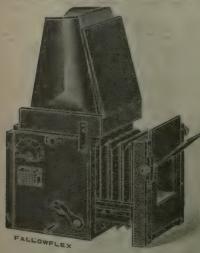
I can supply any reliable photographic article of any make. I keep a full stock of all Papers, Plates and Films, and shall be pleased to send special quotations.

Send for Lists and
Fuller Particulars.

Special attention given to Export Orders.

"FALLOWFLEX" CAMERA.

The most up-to-date and reliable Reflex Camera on the market. Various important patents which are not found in any other camera.



Prices :--

 $4\frac{1}{4} \times 3\frac{1}{4}$... £9 9 0 0 5 $\times 4$... £11 11 0 5 $\frac{1}{2} \times 3\frac{1}{2}$... £12 17 6 6 $\frac{1}{2} \times 4\frac{3}{4}$... £15 15 0

Camera and Focal
Plane Shutter entirely
British.

Illustrated Booklet on Application.

Price, fitted with Lenses.

Camera and three slides			£ s. d.	Postcard £ s. d. 12 17 6	£ s. d.
With "Facile" Anastig. Series I	F/6·8	12 0 0 5 inch	14 10 0 6 inch	15.15 0 6 inch	
With "Facile" Anastig. Series II	F/4·8	14 0 0 5 inch	17 15 0 6 inch	19 5 0 6 inch	
With Aldis Series II	F/6·3	11 0 0 5 ³ / ₄ inch	13 13 0 6½ inch	15 15 0 7½ inchi	19 17 6 8½ inch
With Cooke Series IV	F/5.6	14 0 0 5 inch	16 10 5 6 inch	17 17 0 6 inch	
With Goerz Series III. "Dagor"	F/6·8	14 14 0 5 inch	17 17 0 6 inch	19 5 0 6 inch	
With Goerz Series IB. "Celor"	F/4.5	15 0 0 5 inch	18 0 0 6 inch	19 7 6 6 inch	
With Zeiss "Tessar"	F/4·5			20 17 6 7'1 inch	

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

Jonathan Fallowfield, London.

THE "FALLOWFLEX" CAMERA

Special Tropical or Press Photographer's Model now made in solid polished teak, strongly brass bound.



This model has been a great success. Press photographers who must take photographs in all weathers find it necessary to have a stronger apparatus than the average make, and as their work is done in crowded places, where hard knocks and rough usage is

The "Tropical Fallowflex" is fitted with Russian leather bellows and hood, polished teak body, and special shutter having metal springs and parts of white metal which cannot rust, and is not affected by heat or damp. ‡-plate only stocked, other

ADVANTAGES OF "FALLOWFLEX."

I. -Swift reliable shutter with patent setting quick wind ratchet which gives any H.-Specially rigid double extension, actuated by rack and pinion and spring draw-

III. -- Paten: mirror which folds up allowing a short focus lens to be fitted. IV. -- All the up-to-date improvements of other Reflex Cameras.

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

"RAPIDE" PRINTING MACHINE.

For Postcards and Prints. (Patent No. 25,613.)



- I. Any thickness of card or paper may be used.
- II. Prints and cards may be vignetted.
- III. Absolute contact is assured.
- IV. Prints automatically released after exposure and need not be handled in any way.
 - V. Any size negative up to $8\frac{1}{2} \times 6\frac{1}{2}$ may be adapted.
- VI. Combination gas and oil or fitted for electric light.
- VII. Light is automatically thrown on negative, and may be diffused to suit any negative.

Price, as	illustrated,	for	Oil and	Gas			 52/6
Price, ,,		99	Electric	Light	••	••	 52/6

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

POST CARD NOVELTIES.



For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

Jonathan Fallowfield, London.

BUTTON APPARATUS AND MATERIALS.

COMPLETE SET No. 1.

No. 2 Button Machine. 1 set 36 Lign and Cutter. 6 sheets Celluloid 36 x 20. 10 gross 36 Closed Back Button Parts. Set of Jewellery, 36 Lign Glasses Backs, Book of Instructions, Lists, etc.

Carriage paid to any station in Great Britain. £5.

COMPLETE SET No. 2.

No. 2 Button Machine. 1 set 22, 30 or 36 Lign Dies and Cutter. 1 set 40, 50 or 60

6 sheets Celluloid 36 x 20. Set of Jewellery, Pendants, etc. Book of Instructions, Lists, etc. Carriage paid to any station in Great Britain, £10.

COMPLETE SET No. 3.

1 No. 2 Button Machine.

1 Hand Uniting Roller.

1 set 22, 30, 36 or 40 Lign Dies and Cutter.

1 set 50, 60 or 70 Lign Dies and Cutter. 1 Gas Adhering Roller Complete.

12 sheets Celluloid 36 x 20. 25 gross Button Parts (assorted). Set of assorted Jewellery.

Carriage paid to any station in Great Britain, £15.

COMPLETE SET No. 4.

I Photo Button Camera takes any size.

1 Gas Adhering Roller Plate.

1 No. 2 Button Machine. 3 sets of Dies and Cutters any size, 12 sheets Celluloid 36×20. 30 gross Button Parts (assorted). Set of Jewellery (assorted). Book of Instructions and Lists.

Carriage paid to any station in Great Britain, £20.

DIES AND BUTTON MACHINES.

i Each set contains three dies and a cutter, the die which has a hollow is No. 1, which must be fitted to the upper part or plunger of machine. No. 2 die fits on the left-hand side, and the collar of this is level with the inside. No. 3 die has a smaller opening

and groove to hold the back of Button.

Place a shell in the left-hand die, convex side up, and cover with photo which has been cut to size. For the first movement see that die No. 1 is extended, i.e., that the little steel point prevents the die from closing. Press No. 1 into No. 2, this makes half the button; turn No. 1 so that the little steel point slips into the groove, and press the plunger into die No. 3 which contains the back of the button. Care should be taken to see that the dies register perfectly, also that the pin comes in the right place. This varies with each set of dies and depends upon the position the photograph is placed in No. 2.

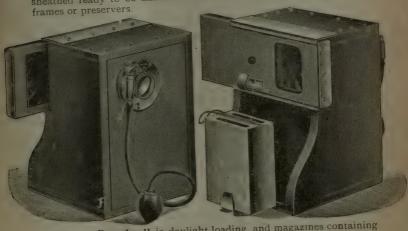
ADHERING ROLLERS.

Heat the roller so that it will sizzle when touched with water. Dip the gelatine print in ordinary alcohol and allow it to remain in liquid till both sides are well moistened. Place a blotter on the plate with a sheet of celluloid between it and the photograph, and cover back of print with tissue paper to prevent hot roller sticking to photograph, roll over same with roller.

For fulier particulars of these goods, see "Fallowfield's Annual" post free, 1/6

The "POPULAR" FERROTYPE CAMERA.

This is an entirely novel and ingenious apparatus, at a price until now unheard of. The cheapest apparatus ever supplied has been 90/-, but the "Popular" has been brought out with the idea of simplicity, and with the knowledge that many more Ferrotype workers will invest 60/- in an apparatus because they can only afford that capital. The size of each picture is $2\frac{1}{2} \times 2$, and the plates are each sheathed ready to be handed to the sitter or to be encased in the



The "Popular" is daylight loading, and magazines containing

36 sheathed plates can be placed in the holder in sunlight.

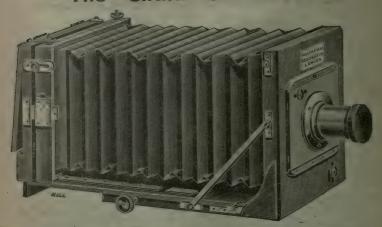
It is a camera strongly recommended for Bazaars, School Treats, and especially to the Amateur. There is no need of studying Photography to use the "Popular," as everything is so simple, and, in fact, becomes automatic.

The box of plates is put into the holder on the left and the lid and paper packing taken out and the slide with focussing screw pushed across; when this is drawn to the right it carries a plate into position; exposure may be made by hand or ball and tube. The plate is then dropped into the bath by pressing small spring.

The plate is then dropped into the bath by property of the plate is then dropped into the bath by property of the plate is the plate in the bath by property of the plate is the plate in the bath by property of the plate is the plate in the bath by property of the plate is the plate in the plate is the plate in the plate in the plate is the plate in the plate in the plate in the plate is the plate in the plate in the plate in the plate is the plate in the p		0	0
Special Tropical Model made entirely in metal with path	6		
automatic developing bath 36 Sensitized Ferro Dry Plates (Extra Rapid) in tin for daylight loading for "Popular"		3	0
a let #muol?	net f	ree	1/6

For fuller particulars of these goods, see "Fallowfield's Annual" post free 1/6 Jonathan Fallowfield, London.

The "C.X.R." CAMERAS.



This Camera is made of the finest seasoned mahogany, and fitted with best leather bellows, the brass work is of the very highest class. It is the best camera for all practical use abroad, being strongly built, and I have sold a large number for the export market, and where possible I recommend it to be brass-bound.

The rack and pinion are of special pattern, designed to work smoothly and without jumping, so that the back when racked out is perfectly parallel with the front. Double swing back, rising and falling and cross front are provided; for general work, including Telephoto Work, Portraits in Studio, Groups, Landscapes, Architecture, Copying, etc., this is the best and most useful pattern made.

		Cı	amera a Dark			ble	Brass E	Bin xtra			Extra lides	
63 ×	43		£8	0	0 '	'	£1	- 0	0	 £0	15	0
8 1 ×	63		10	10	0		1	10	0	 1	0	0
IO X	8		12	0	0		1	12	0	 - 1	4	0
12 X	10		14	10	0		1	15	0	 1	10	0
15 X	12		18	0	0		2	0	0	 2	0	0
18. X			26	0	0		2	10	0	 3	0	0

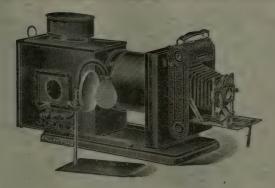
Foreign sizes made up to order, price as nearest (larger) English sizes.

Capt. WHEELER, Editor of "Telephoto Quarterly," says:—
"I suggest your giving prominence to your excellent square-form cameras which cannot be surpassed for all-round Telephoto work:"

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

Jonathan Fallowfield, London.

THE "FALLOROLL" ENLARGER.



Although there are many models of enlargers now on the market, I feel sure the demand for the "Falloroll" Enlarger will be considerable, not only to the thousands of "Falloroll" Camera users, but to amateurs who have similar small cameras.

The body is Russian Iron, well ventilated, large and square, and suitable for either Gas or Electric Arc Lamp. The Double Sleeve Pattern Bellows permits long extension from light to condenser. The woodwork is of ebonised wood, making a particularly smart amagentus.

smart apparatus.

The condenser is double plano-convex of special white glass, and the carrier can be moved to any position, upright or oblong. The adapter holding camera is also reversible, so that any necessary movement may be obtained.

I strongly recommend the inverted incandescent gas burner, as it gives the most suitable intense and concentrated light next to the electric arc.

Enlarging with the "Falloroll" Enlarger adds interest and pleasure to all users of small cameras, and both for winter and summer evenings great fascination can be found in making bromide enlargements from either plates or films of particular subjects.

ENLARGING EASELS.

I have made up a cheap model of Easel specially suited for the "Falloroll" and other styles of enlargers. They are made of soft white wood, easy for fastening bromide paper or prints to be copied. Every movement is possible as they swing from the centre, and by means of the adjusting screws very fine alterations are possible. They are very rigid and a necessity with every enlarger.

				s. d.
No. 1 for paper up to 12 × 10			***	8 6
No. 2 for paper up to 15×12				10 6

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

"FACILE" ANASTIGMAT LENS.



Series II., F/6.8. Series II., F/4.8.

The price obtained for Anastigmat lenses up to two or three years ago prevented many workers from using other than the cheaper RR lenses, but through more practical manufacture and the fact that patents have run out, Double Anastigmats are now put on the market, at prices of best quality Rapid Rectilinear lenses. There are, however, many imitations of well-known

lenses put on the market, but most of them are made by small workers abroad who have not the facilities to turn out good metal work or to adjust the cells exactly.

The "Facile" Double Anastigmat is equal to any make of similar lens, and better than most; they cover the plate sharply to corners, and when used as wide angle lenses they will cover a plate several times larger with absolute colour correction. They have large angle, great depth of focus and perfect correction with the single combinations, which may be used separately.

Made in style as illustration, or sunk mount for reflex and folding cameras at same price.

PRICES OF "FACILE" ANASTIGMAT.

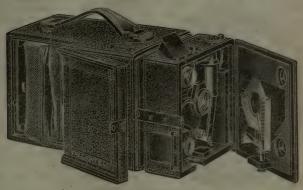
5 inch 6 inch 7 inch 81 inc	h	9½ inch
$4\frac{1}{4} \times 3\frac{1}{4} \dots 5 \times 4 \dots 6\frac{1}{2} \times 4\frac{3}{4} \dots 7 \times 6\frac{1}{2} \times $	5	83×63
Series I. 55/ 60/ 72/6 . 95/ Series II. 105/ 126/ 145/ 190/		110/-

Any of these lenses may be had on seven days' free trial, provided deposit to value and carriage is paid and lens returned perfect.

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

Jonathan Fallowfield, London.

FALLOWFIELD'S "PREMIER."



Design showing working parts.

The "Premier" carries 12 plates or 24 Films and each Changing Box carries a similar number. It measures $10\times5\frac{1}{2}\times5\frac{1}{4}$ and weighs only $4\frac{1}{2}$ lbs.

The Lens is Wray's well-known R.R. Hand Camera Lens of $5\frac{1}{2}$ in focus, fitted with Stops F 8, 11, 16 and 22, which are worked by the Milled Head and Indicator from outside, and both combinations are easily taken out for cleaning.

The Shutter works between the Lenses, and being provided with Newman's Pneumatic Regulation can be set for exposures of any duration from 100 to 1 sec. by the adjustment of Milled Head on top of Camera. It is set by pulling up the small Ebonite Knob and automatically released by pressing a button in base. It is both scientifically and practically accurace in working.

The Self Cap works in front of Lens, and being Automatic in action the Lens is always covered except at the actual moment of exposure, and for time exposures it may be held open by turning the small knob in front.

Focussing is done by central rack and pinion, and the knob is sunk flush in the base of Camera. A scale of accurate distances, 6, 9, 17, 18, 25, 35 feet and infinity is seen through a small aperture on top of Camera. For use on Tripod a light Celluloid Screen (which is carried behind Changing Box) is provided.

Two Finders are provided, giving identical view on plate, and with metal hoods. Plate Changing is the well known "N. & G." method.

The Box is held in position in Camera by the focussing screen, which has a groove to hold the Ebonite Shutter.

There are some hundreds of Premiers giving utmost satisfaction all over the world, and I cannot possibly recommend a better article for the serious worker.

Price, Covered in finest Black Morocco, with one Changing Box and Leather Sling Case, with lock and key.

Premier Camera, $4\frac{1}{4} \times 3\frac{1}{4}$, as above £8 8 0

Extra Changing Boxes, £1 17 6 each.

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

THE "TAKUQUICK" FERROTYPE CAMERA

(Victoria Size.)



No. 1a Takuquick.



No. 1b Takuquick.

"Takuquick" (Victoria Size) Apparatus, complete with-

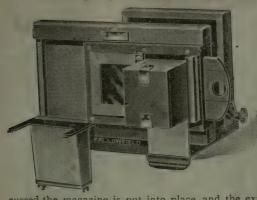
out Stand £6 6 0
Three different Models, all same price, Special Sheathed Plates, 2/3 per tin of 30. Stands, 7/6 to 18/0.

"Takuquick" No. 2, complete without Stand ... Size 2½×2. Plates in packets of 36, price 2/6.

... £10 10 0

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

The "AUTODELL."



This is an entirely new and novel apparatus for use with any camera. It is a Repeating Back with Magazine holding 30 sheathed ferrotype plates 2½ × 2.

The focussing screen is shown in the first illustration in position, and the safety sheath let down from magazine. When fo-

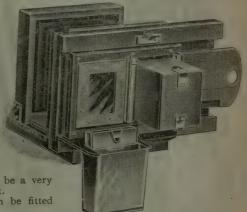
cussed the magazine is put into place, and the exposure made, then the changing board is pushed along until the sheathed plates

fall into the developing tank and cradle shown in second illustration; after 20 seconds immersion it should be dipped in the fixing division for 30 seconds, and is then ready.

Pictures can by this method be made at the rate of 30 per hour, and with the beach photographer there will be a very

great demand for it.

Extra backs can be fitted in daylight.



Price, with two Magazines, £3 10 0.

The "Popular" Sheathed Plates can also be used, price 3/0 per 36.

The Illustrations show the "AUTODELL" fitted to a ½ plate Studio Camera, it may easily be adapted to any size Camera, and will not interfere with the dark slide when required for ordinary portraiture.

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

PRINTING FRAMES.

"C.X.R." TEAK.

Although there are many Printing Frames on the market at the present moment, there are practically no frames that will stand the hard life which the trade printer or professional expects of them. The "C.X.R." well-known teak frames have always been looked upon as the highest and best value ever offered. Teak wood has advanced so in price that it is now nearly the most expensive obtainable, and, in fact, the only teak which I am able to use for these frames comes from the various Railway Companies, and is part of old carriages, so that it is impossible to obtain better seasoned wood than the "C.X.R." Printing Frame.



Although the price has been advanced it is quite impossible to find as good a teak frame anywhere as above, and I have been obliged to put an enormous stock in hand to obtain the low price.

					10 10 77	price,	
Size. $3\frac{1}{2} \times 2\frac{1}{2}$		1	Round corn Feak screw 1st qualit Doz.	ed.		Round Teak not 2nd q Each,	corners. screwed. uality. Doz.
. 2 2			5/-				
$\begin{array}{c} 4_{4} \times 3_{4} \\ 5 \times 4 \end{array}$	• •		6/			-/6	5/6
$5\frac{1}{5} \times 3\frac{1}{5}$			7/6			-/8	7/-
2 2			8/6			-/8	-
- 4			10/-			-/10	7/-
$6\frac{1}{2} \times 4\frac{3}{2}$			10/6			-/10	9/6
$7\frac{1}{2} \times 5$			12/6				9/6
$8\frac{1}{2} \times 6\frac{1}{2}$			20/-			1/2	12/-
10×8			30/-	• • •		1/4	14/-
12×10			42/-	• • •		2/3	26/-
15×12					• •	3/-	33/-
ntinomant			54/-	• •		4/3	48/-

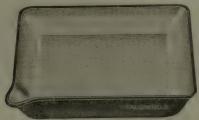
Continental and other sizes are charged at nearest higher price.

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

THE "C.X.R." ENAMELLED STEEL PHOTOGRAPHIC DISHES.

(BRITISH MANUFACTURE.)

Finest hard white enamel inside, and dark colour outside. Very superior pattern with wired edges, flat bottom, and lip for pouring. Extra strong.



- 12	mi	0

For Plates	3			Each.	For Plat	es			Each.
					12×10				
					15×12				
$6\frac{1}{2} \times 4\frac{3}{4}$					20×16				
8½×6½		• •	• •	1/10 2/6	24 X I 9	• •	• • •	• •	17/6



New in design, strong, having iron ends and wood side bars and trough. They cannot be upset. They are 2 feet long and hold 43 plates, any size up to 16×18 . They are made for SERVICE, and are far superior to any rack previously introduced. The prominent new feature of this rack, which cannot fail to delight all purchasers, is its trough to catch drippings. Price 6/—each.

For fuller particulars of these goods, see "Fallowfield's Annual" post free, 1/6

THE NOTE OF THE AGE IS

Convenience!

Photographers, like all Specialists, want everything very good, everything "just so." To get it some of them seem to think it necessary to trot half round London, and correspond briskly with a number of firms. Why waste time and energy in this way? You can always get

The Best of Everything Photographic,

You Pay No More, Often Less! of any Reliable Make, From FALLOWFIELD,

who in Half-a-Century has accumulated quite enough knowledge and practical experience to enable him promptly to meet any Photographic Requirement, large or small.

He has always in stock great stores of-

CAMERAS and Tripods, Photo Specialities, Plates, Chemicals, Sundries, all of the Highest Quality.

LENSES by Aldis, Beck, Busch, Dallmeyer, Goerz, Ross, Staley, Taylor & Hobson, Voigtlander, and Zeiss.

REFLEX CAMERAS—A Speciality; the largest stock of various makes to choose from.

THE WISE PHOTOGRAPHER, whether he only wants a packet
. of the last new Paper, or is anxious to get the best possible
Complete Outlit for a Sporting or Scientific Expedition, doesn't
worry, but just writes or goes to—

JONATHAN FALLOWFIELD,

146 Charing Cross Road, London, W.



GOKE LENSES

Cooke Lenses consist of three simple glasses uncemented, and therefore transmit more light than do any of the more complex forms, while our unique system of screw adjustments enables us to reach a higher standard of excellence than can be obtained by any other means. Comparison will prove that Cooke Lenses are the simplest and best.

The Series III. are the best for those desiring "universal" anastigmats of the very highest quality. They are designed for general photography, landscapes, street scenes, interiors, and al rapid work requiring uniformly sharp definition.

The SERIES IV. are specially designed for high-speed photography with focal plane shutters
The SERIES V. are similar to the SERIES III. except for their smaller apertures.

SERIES III. 1/6.5.

Approximate equivalent focus.	Size of	Plate.	Diameter of Flange Screw.	PRICE with Flange.	
	At full aperture.	At f/16.			
3 41	21 × 21 31 × 31 41 × 31	3 × 3 5 × 4 6½ × 4¾	14 14 14	£3 4 0 3 14 0 4 2 0	
55000 6000 731	44 × 34 5 × 4 6½ × 4¾ 8 × 5	7 × 5 8½ × 6½ 10 × 8	I de la	4 7 0 4 12 0 5 12 0	
9½ 11	8½ × 6½ 8½ × 6½	12 × 10 14 × 11	134	8 14 0 10 12 6	

SEDIES IV. 1/5'6.

			-,	
5	4 × 3 1	5 × 4	11/2	£4 9 6
6	5 × 4	7 × 5	12	4 19 6
8	6½ × 4¾	$8\frac{1}{2} \times 6\frac{1}{2}$	IŽ	6 6 0
92	8½ × 6½	to x 8	2	9 5 0
II	8½ × 6½	15 X 10	25	12 14 6
13	10 X 8	11 × 11	3.	15 3 0
16	12 X 10	15 X 12	32	21 3 6
18	15 × 12 !	18 × 16	4	21 4 0

SERIES V. 1/8.

44 5 5 6 72 9	3½ × 3½ 4½ × 3½ 4½ × 3½ 5 × 4 6½ × 4¾ 8 × 5	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	£3 0 0 0 3 5 0 0 0 0 0 0 0 0 0 0 0 0 0 0
II	8½× 6½	15 × 12	14	7 17 0
13	10 × 8	17 × 14	2	10 2 0
16	12 X 10	20 × 18	21/2	15 2 6
18	15 × 12	24 × 20	3	18 13 0
25	18 × 16	27 × 24	4	30 4 0
30	24 × 20	Propor-	5	42 5 0
36	27 × 24	ly larger	6	56 6 0

COOKE PORTRAIT LENSES



Made in one size only.

Series IIa. f/3.5.

This is an ANASTIGMAT Portrait Lens of extreme rapidity, possessing qualities not found in any other portrait lens of equal aperture. It upholds all the characteristics of the Cooke Lens, maintaining keen definition right up to the margins of its plate, and it is supplied with a diffusing adjustment providing the operator with a ready means of introducing any required softness.

PRICE £18.

12-inches focus, for Cabinet Portraits.

Series II. Aperture f/4.5.

This Series is designed for high-speed photography, for the finest portraiture, and for difficult subjects under extremely poor conditions of lighting. The roll-inch and r3-inch lenses are provided with a new diffusion adjustment, operated from the front of the camera.

Approximate equivalent focus.	Size of Plate.	Diameter of Flange Screw.	PRICE with flange.		
4	3½ × 3½	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	£4 2 0		
5	4½ × 3½		4 17 0		
6	5 × 4		5 9 6		
8	6½ × 4½		6 12 6		
10½	8½ × 6½		13 17 6		
13	10 × 8		21 4 0		

Series VI. Aperture f/5.6.

These Portrait lenses are supplied in special mounts with rotating rings which control the definition and work the Iris diaphragm. The rings are operated from the back of the camera by means of pulleys and cords. This device enables the photographer to watch his ground glass and regulate to a nicety the depth of focus, the softness and roundness of the image, and the volume of light on the plate.

Approxi- mate Equiva- lent focus.	Plate covered at 1/5.6.	Plate covered at f/16.	Diameter of Flange Screw	Diameter of Hood.	PRICE with Flange, Pulleys and Cords
13	10 × 8	14 × 11	3	2·8	£15 13 0
16	12 × 10	15 × 12	32	3·3	22 3 8
18	15 × 12	18 × 16	4	3·6	25 14 0

COKE LENSES in Sunk Mounts.



To meet the growing demand for Lenses in Sunk Mounts, suitable for collapsible and Reflex types of Cameras, we have designed this special sunk form of mount, and shall be pleased to supply Cooke Lenses, complete with flanges, in such mounts.

Prices on Application.

THE CONVERTIBLE COOKE LENS-Series I. F/6.5.

is a universal Anastigmat in the fullest sense of the term. It has three foci, 8, 14. and 20 inches, and each of its components is an Anastigmat of three thin uncemented glasses, covering its own size of plate sharply at full aperture.

Approximate equiva- lent Focus. Inches. Size of Plate	Aperture.	Diam. of Flange Screw.	Price in Morocco Case.	Price in Volute Sh'tr with case.
Complete lens8 $\begin{cases} 7 \times 5 \\ 6\frac{1}{2} \times 4\frac{3}{4} \\ 12 \times 10 \end{cases}$ Front Component 14 Back Component20 15 × 12	f/6*5 f/11 f/11		£15 15s.	£19 19s.

THE PRIMOPLANE COOKE LENS-Series VII.

This is a development of the Cooke Lens, designed specially for wide angle work at a large aperture.

Equivalent Focus.	Plate covered at f/6.5.	Plate covered at f/16.	Diam. of Flange Screw.	PRICE WithFlange
5 in.	6½ × 4¾	$8\frac{1}{2} \times 6\frac{1}{2}$	11/2	£ s. d. 4 2 0

TAYLOR, TAYLOR, & HOBSON, ITP

STOUGHTON STREET WORKS, LEICESTER.

18 BERNERS STREET, LONDON, W. AND 1185 BROADWAY, NEW YORK.

PHOTOGRAVURE.

A LUCRATIVE SIDE LINE

for the PROFESSIONAL PHOTOGRAPHER.

Highest quality of Work. Enquiries invited.

ALLEN & CO. (London), Ltd., 107, CLIFTON STREET, FINSBURY SQUARE, E.C.

FRANCE.

J. SCORY.

Successors :—
SCORY & QUENTIN.

OPTICAL GLASS, FLATS, UNWORKED SPECTACLE GLASSES.

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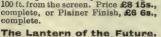
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As supplied to

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rect Exposure required for every speed of plate, on every kind of subject, and under every condition of light. For any set of conditions of LIGHT, and LENS PLATE, APERTURE, only two simple operations are necessary to find

simultaneously the correct exposure for every stop from the largest to the smallest, viz. :-FIRSTLY .- Turn the

milled edge of the instrument, and thus expose through the slot a fresh surface of sensitive paper

AN unerring guide to the cor-

until it assumes the colour of painted tint, and note the number of seconds or minutes it takes to colour.

This is called the Ac-TINOMETER TIME.

SECONDLY .-- Set the movable scale until this ACTINOMETER TIME is against the F SPEED NUMBER OF THE PLATE to be used(seePlateSpeed List below), then against every stop in outer scale will be found the correct corresponding exposure, or, shortly, you set the one Scale. it does the rest.

Speed Numbers of a few makes of Plates. Full List supplied with Meter.

Paget XXX	 	Speed f/56	Lumière Extra Rapid	 Speed f/78
Eastman Film			Mawson's Electric	
Ilford Empress Imperial Special F			Wratten Ordinary Warwick Double Inst.	,, f/23 ,, f/90

The following examples illustrate the extreme simplicity of the Exposure Meter:

A		P Plate to be used. See List of Plate Speeds above.	1	1 2		
No. 1	8 sec. 3 sec. 6 min. 48 sec. 32 min.	Paget XXX Speed f/56 Lumière Ex. Rapid ,, f/78 Eastman Film , f/78 Warwick Double Inst. ,, f/90 Wratten Ordinary ,, f/23 Mawson Electric , f/66	f/32 f/5½ f/16 f/8 f/28	3 sec. 14 sec. 2 min. 3 sec. 48 min.		

To find the correct exposure in each of these examples, set Actinometer Time in column A against Plates Speed Number in column P, then against the stop to be employed in column S will be found the correct exposure in column C, and in each case the correct exposure will also be simultaneously shown against every other stop on the outer scale.

[See following pages.

WYNNE'S Patent INFALLIBLE EXPOSURE METER

(Continued.)

Berrylands House, Surbiton, Surrey.

Gentlemen.

As the winner of the £50 prize recently given by "The World and His Wife" for the best photograph of an interior, it may interest you to know that I made the exposure for negative of same by use of your "Infallible" Exposure Meter.

Yours faithfully, R. FREDERIC TYLER.

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[See preceding and following pages.

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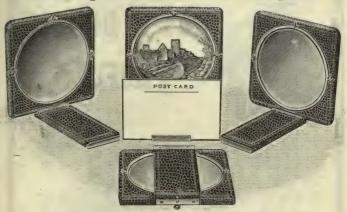
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See preceding pages.



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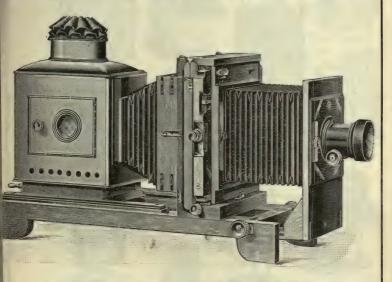
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3	LIGHT INTENSITY - DATE TABLE 2 4 8 16 DIAPHRAGMS	
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ARSOLUTELY RELIABLE. EASILY UNDERSTOOD. PRACTICAL AND USEFUL. No Actinometer required, the whole of the data being on the Instrument.

This Meter has now been greatly improved, and is guaranteed to be "THE PERFECT" EXPOSURE METER.

When the two slides have been set, which takes only two seconds, it shows at a glance the exposure for every aperture of lens. The plate-speeds commence with unity as a minimum, and are in the ratio of the exposure scale. They are 1/10th of the Hurter & Driffield numbers, and about 1/15th of the Watkins numbers. The corresponding speeds of Hurter & Driffield, Watkins, and Wynne are given in a table with each meter, as below :-

Phillips' Plate Speed No.	Speed in "Times Wet-plates"	H. & D.	Watkins	Wynne	Plate.
1	2½ 3¾ 5	10	16	24	Ilford Process.
	33	15	12	30	Gem Process.
2	5	20	32	36	Mawson Half-tone.
	7½ 10	30	45	43	Ilford Half-tone.
4		40	65	49	Ordinary Plate,
	15.	60	90	61	Medium Plate.
. 8	20	80	130	69	Rapid Plate.
	30	120	180	81	Extra Rapid Plate.
16	40	160	250	103	Ultra Rapid Plate.
	60	240	350	120	Wellington Extra Speedy.
32	80	320	500	138	Lumière Violet Label.
	120	(480)	(720)	172	Wratten Panchromatic.
64	160	(640)	(940)	196	

W. H. PHILLIPS & SON, Photographic Instrument Makers, 98, TRURO ROAD, WOOD GREEN, LONDON, N. Telegrams: "SLIDICAL, LONDON."

The meter can thus be used with plates marked with any of these speed numbers (or the next lower number when the exactly corresponding number is not in the list).

The meter is made in four qualities as below :-

- No. 1. In box-wood, contained in cloth-covered case, with book of instructions. Price, post free, 5/5.
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Will also give the equivalent focus of a lens.

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has rack and pinion working in both directions, giving an extension of 164" from lens to plate in the 5 × 4 size. This movement towards both back and front gives the Camera great rigidity on the tripod head when at full extension. The back swings both ways over a considerable angle, whilst the front is given a full rise and is also able to swing

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Description.	1-plate		5 ×	4.	1/2-1	plat	e.
Sanders's "Shafta" Camera, complete with three double book-form slides and brilliant finder, but without lens or shutter. Ditto with Dallmeyer new stigmatic lens, series 4,	£ s. d		~		~	s. 10	
f/6·3, fitted with new silent shutter, all finished dull black (focus of lenses \(\frac{1}{2} + 4\frac{3}{2}; 5/4 - 6\frac{7}{2}; \frac{1}{2} - 7\frac{7}{1}\). Ditto with Aldis Oxys lens, f/5·65 and Bausch & Lomb shutter (foc. of lenses, \(\frac{1}{2} - 3\frac{1}{2}; 5/4 - 6\frac{3}{2}; \(\frac{1}{2} - 7\frac{7}{1}\) Ditto with Ross Homocentric lens, f/6·3 & com-		0	12 11	0	14	14	0
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Captain, R.E.

N.B.—The original letter can be inspected if desired.

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- 1-plate Shew's Aluminium Xit Dallmeyer Stigmatic Lens, f/6, in Unicum shutter, 3 double slides, brilliant finder and case. Cost £10 10s. £5 17s. 6d.
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Post Card size, 5½ × 5¾ Goerz Folding Pocket Tenax. Series III. Dagor lens, f/6·8, compound shutter, 6 slides. Cost £12 18s. £10 10s.

Post Card, 5½ × 3½ Adams Idento, Ross homocentric, f/6·3, 3 double slides, leather case. Cost £17 2s. 6d. £11 5s.

Post Card, $5\frac{1}{2} \times 3\frac{1}{2}$, Sanderson Regular, hand or stand, Ross homocentric, f/6'3 lens, Unicum shutter, 6 double slides. Cost £15 5s. £10 10s.

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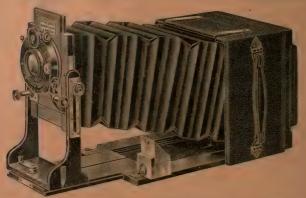
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Showing Standard "Una" with Long Extension and the Double Rising Front.

The Sinclair "UNA" Camera is THE BEST of its Class,

BECAUSE-

- IT is suitable for every class of work.
- IT will take short, medium or long-focus lenses.
- IT may be fitted with any shutter.
- IT has great latitude in all movements.
- IT is constructed on practical and scientific lines.
- IT has a very great rising front.
- 1T has a central swing front.
- IT has a revolving back.
- IT is simple in construction and use.
- IT is suitable for Telephoto work.
- IT can be fitted with any Changing Arrangement, Dark Slides, Changing Box, Eastman Roll Holder or Premo Film Pack.
- IT is made of the best materials and with the perfection of workmanship.

The "Sinclair UNA" Camera (continued)

IS THE BEST FOR ——— HAND OF STAND.

It is a fallacy that, provided the photographer has a good lens, anything will do in the way of a camera. The reverse is actually the case, for a good lens on an indifferent camera may be compared to a good bullet in a bad gun. A good lens is an instrument of precision, and a carefully constructed camera is necessary



Showing Standard "Una" with normal extension.

to utilise its good qualities. In the "Sinclair Una" it has been our aim to make an instrument as perfect as possible for every class of work, and without those useless movements which are crowded into every cheap camera making them entertaining puzzles for beginners, but such as the expert does not wish or require. The construction of the "Una" Camera is of the utmost simplicity. Moreover, it is very compact, but we have not reduced its size at the expense of efficiency. The weight of the 1-plate "Una" is not more than that of many wellknown \(\frac{1}{2}\)-plate cameras. Every instrument being carefully and exactly scaled, it is particularly adapted for the best work, and will answer the most exacting requirements of the Amateur or the Professional. The "Una" Camera is a scientific instrument, and not a toy. Any form of diaphragmatic or focal plane shutter may be fitted, and almost any lens used. In cases where the photographer finds any difficulty in estimating distances, the camera may be held to the level of the eye and accurately focussed on the hooded ground glass without the necessity for a focussing cloth. The level, finder, and focussing scale are arranged so that they are easily and simultaneously seen, an important point in hand-camera work.

The Sinclair "UNA" Camera is the most perfect instrument of its type, and is the outcome of many years' use and intimate acquaintance with the leading makes of hand and stand cameras. It is not easy to judge cameras from makers' catalogues, and we would impress upon intending purchasers of cameras to see a "UNA" before buying any other make. It is in essential detail work that makes a "Una" so much better than any other instrument.

SOME DETAILS OF THE "UNA" CAMERAS.

The Sinclair Camera Front is solidly made with a broad firm base, which may be instantaneously clamped to the baseboard in any desired position and with absolute rigidity—an important, and, indeed, essential point generally lacking in instruments of somewhat similar design.

The Sinclair Double Rising Front is a peculiar



The "Una" Camera, showing revolving back as fitted to all patterns.

feature which we have designed to give the maximum of movement in a new and simple fashion, so that the wide angle covered by modern anastigmat lenses may be utilized, thus dispensing with the undesirable swing back. This great and important improvement enables the operator to photograph tall buildings without stopping down the lens to the same extent as when a swing back is used. By means of the double rising movement great range is secured, the amount of rise in the various sizes being as follows:—

 $\frac{1}{4}$ plate, $2\frac{1}{2}$ inches. 5×4 , $2\frac{5}{8}$ inches. $\frac{1}{2}$ -plate, 4 inches. Moreover, not only is this rise gained, but it is of practical use, because the bellows are purposely designed very deep in the front, and the body of the camera automatically opens as the movement is placed into operation.

The Sinclair Central Swing Front. Providing a camera has sufficient rise to the front, a swing back or swing front is rarely needed with modern lenses because of the large angle they cover. The swing back as generally fitted is also objectionable, as it at once obviates the use of the focusing scale through the lens having to be racked further back when it is brought into play. The Sinclair central swing front has all the good points of the swing back, and has the important advantage that it may be used without seriously upsetting the focus of the lens, because it is arranged so that it comes in the optical centre of the lens panel. Moreover, it is quite distinct from the rising front movement, and need not be brought into play unless desired.

The Sinclair Revolving Back. This very important improvement on the old reversing back will be generally appreciated. The plate can at once be changed from the vertical to the horizontal position without removing the back of the camera, and this may be done while the plate is exposed in the slide ready for use. The back of the camera with the slide revolves on a light-tight turntable.

The Sinclair "UNA" Finders.—With the $\frac{1}{4}$ -plate or 5×4 cameras either brilliant or ground-glass finders are supplied. The Brilliant Finder has a reversible mask and is constructed so that the angle is correct for either a 5-inch lens on a $\frac{1}{4}$ -plate camera or a 6-inch on a 5×4 camera. For $\frac{1}{2}$ -plate and 7×5 in. cameras we fit a specially constructed ground-glass finder of large size, with a reversible metal mask adjusted to the focus of the lens used. There is a rising front on the finder itself, and this can be graduated to correspond with the rising front on the camera The amount of rise given on the finder is sufficient for all hand-camera work. Ground-glass finders can be masked to show the effect of the rising front at an extra cost of $\frac{1}{5}$

The Ground-Glass Screen is covered with a Focussing Hood so arranged that it can be removed in a moment should a focussing cloth or focussing glass be preferred.

The Levels.—Behind the finder and near the focusing scale two tube levels arranged in the form of a T are inserted, and it is convenient to keep an eye on these when viewing the image in the finder. In the case of the De Luxe No. 2 a circular level is used.

The Focusing Scales.—These are of real ivory and let into the baseboard of the camera. We divide the scale into yards and not into an odd number of feet, which are exceedingly difficult to judge. 2, 3, 4, etc., yards correspond to 2, 3 or 4 good strides, and are easy to estimate, but such distances as 7, 11 and 13 feet, which are often used, are very confusing. An ivory depth of focus scale can be supplied at an extra charge of 5/6.

THE SINCLAIR TRIPOD SCREW.



The Sinclair Screw supplied with each "Una" Camera removes all difficulty in attaching camera to tripod stand. The screw fits into the camera at the proper distance, a stop preventing it going too far. The camera with the screw attached is then put on the stand and a fly-nut is easily screwed on underneath. It is a simple thing but adds to the photographer's comfort. Standard 1-inch Whitworth Screw.

TYPES OF THE "UNA" CAMERAS.

- The Sinclair Standard "Una."—This is the instrument described above, and
 is the one most generally useful for amateur or professional work.
- The Sinclair Tropical "Una."—This is exactly the same in design as the Standard Model, but is made of polished teak, brass-bound, instead of mahogany covered with morogco leather.
- 3. The "Una" De Luxe No. 1.—A similar instrument to the Standard Mode but is covered with either black or brown hand-sewn leather.
- 4. The "Una" De Luxe No. 2.—This model has triple extension and is supplied with rackwork to the back as well as to the front of the camera, and is made for those requiring exceptional range for tele-photography, or for extreme wide-angle work.

5 & 9 in.

PRICE LIST OF

	Form.
The Sinclair "UNA" Camera, complete with brilliant or ground-glass View Finder, and three double Plate Holders, but without lens or shutter	Standard Tropical De Luxe No. De Luxe No.
Ditto, ditto, with Bausch & Lomb Lens and Bausch and Lomb "Automat" Shutter	Standard Tropical De Luxe No De Luxe No.
Ditto, ditto, with Aldis "Anastigmat" Lens F/6, and Bausch and Lomb "Automat" Shutter. Foci of lenses—4-pl., 5 in.; 5×4, 6 in.; ½-pl., 7 in.; 7×5, 8½ in.	Standard Tropical De Luxe No. De Luxe No.
Ditto, ditto, with Cooke Series V. F/8 Lens and "Automat" Shutter. Foci of lenses—\(\frac{1}{4}\)-plate, \(5\) in., 5×4, 6 in.; \(\frac{1}{2}\)-plate, $7\frac{1}{2}$ in.; 7×5 , 9 in	Standard Tropical De Luxe No. De Luxe No.
Ditto, ditto, with Ross F/6·3 "Homocentric" Lens and Compound Sector Shutter. Foci of lenses— 1-plate, 5 in.; 5×4, 6 in.; ½-plate, 7 in.; 7×5, 8½ in.	Standard Tropical De Luxe No. De Luxe No.
Bi in	Standard Tropical De Luxe No. De Luxe No.
Ditto, ditto, with Zeiss F/4.5 Tessar Lens and "Compound" Sector Shutter. Foci of lenses— 1-plate, 6in.; 5×4, 6in.; 1-plate, 710 in.; 7×5, 81 in.	Standard Tropical De Luxe No. De Luxe No.
Ditto, ditto. with F/6·3 Zeiss Double "Protar" Lens, Series IV., 2 foci, New "Compound" Sector Shutter, and two focussing scales. 1-pl. 5×4 1-pl. 7×5 5 & 9 in. 63 & 113 in. 8 & 14 in. 8 & 14 in. Ditto, ditto, with F/6·3 Zeiss Double "Protar" Lens,	Standard Tropical De Luxe No De Luxe No.
Ditto, ditto, with F/6·3 Zeiss Double "Protar" Lens, Series VIIa., 2 foci, New "Compound" Sector Shutter, and two Focussing Scales. 4-pl. 5×4 2-pl. 7×5	Standard Tropical De Luxe No. De Luxe No.

For Extras and Gen Fitting customer's own lens which is in a suitable shutter ready for fitting *9×12 centimetre Cameras may be We always fit Zeiss Lenses of British make unless specially instructed to the contra orders. The Price

8 & 14 in.

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INCLAIR'S "UNA" CAMERAS.

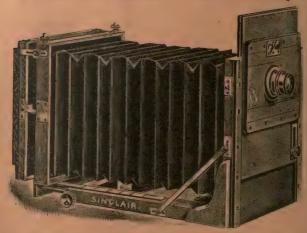
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indries see General Catalogue.

aking one Focussing Scale, 7/6; or fitting and making two focussing scales, 15/0.

same price as the 5×4 size. sould the German Lenses be required, extra time must be given for the execution of e same in both cases.

SINCLAIR'S "TECHNICAL" CAMERA.



As supplied to the Indian Government, the Siamese Government, Engineering Works and Scientific Institutions.

Specification.

Camera and slides of finest Spanish mahogany, double extension, improved front giving very great rising and falling movement, improved swing back, check screws to all possible milled heads, reversing frame, horizontal sliding front, dark slides fitted with special spring fastenings, and shutters with rebated hinges.

Camera and 3 double dark	61	× 4 ⁸		81	× 61		12	× IC)	-15	× 12	
slides	£9	0	0	£11	0	0	£16	10	0	£20	0	0
Extra dark slides, each	1	1	0	1	4	0	1	16	0	2	8	0
Export Model, special teak												
and brass-bound cam-												
era and 3 slides	11	7	6	13	15	0	20	0	0	24	0	0
Best solid leather case with										2		
spring lock	1	15	0	2	12	6	4	0	0	6	6	0
Rule joint tripod stand	1	2	6	1	2	6	1	11	6	1	15	6
				or ca								

Messrs. Cole, Marchent & Morley, Ltd., Prospect Foundry, Bradford, write:—
"We congratulate you on the careful attention shown to a number of details which are often omitted."

JNO. B. SCRIVENOR, Esq., Government Geologist, Federated Malay States, writes:—"The whole-plate camera gives every satisfaction."

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, LONDON, S.W.

Sinclair's "Traveller" Roll=Film Camera.

For Pictures, 4\(\frac{1}{4}\times 3\(\frac{1}{4}\) inches. No opening of the Camera. No setting of the Shutter. No focussing required. It is always in focus. It is always ready for use.



An extended experience of "Hand Cameras and hand camera users has shown us that there are a very large number of people who require a camera of the simplest possible description, always in focus for the general range of subjects, and one in which the possibilities of error are reduced to a mini-mum. It is to fill such requirements that we have intro-duced the Sinclair "Traveller"

Roll-Film Camera. This camera will not only appeal to the novice but also to the expert who is interested in genre photography and who knows the difficulty in

obtaining figure subjects in sharp focus.

The Camera consists of a box, the back of which looks something like a Kodak in that it will take the ordinary Kodak Spool as used for the No. 3 F.P. Kodak Camera. These spools can be universally purchased.

The Lens. - This very important part of the camera is, of course, the feature which makes the outfit perhaps rather expensive at the commencement, but yet cheap which makes the outif perhaps rather expensive at the commencement, but yet cheap when it is considered how much is saved in films by having an accurate instrument. We fit a 90 mm. Series III., Fi/68, Goerz Dagor Lens. This covers the ½-plate sharply to the corners with the largest stop and at the same time gives enormous depth of focus, and thus enables us to dispense with any focussing adjustment.

The Shutter.—Simplicity has guided us in this and consequently we have selected the Bausch & Lomb "Automat," a shutter which is always set and yet one on which the speed and diaphragm can be altered for various seasons of the year.

The Finders.—Two brilliant view finders are fitted, so that either upright or horizontal pictures may be taken.

horizontal pictures may be taken.

The Levels.—Behind each finder is a T level, a useful adjunct if straight lines are required in the pictures.

£10 10 0 Nett Cash.

Code Word-Sostratos.

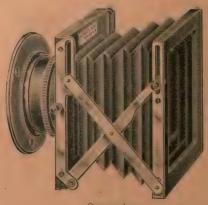
Best Hand-Sewn Leather Case, with sling and lock and key,... £1 1 0 Code Word-Sostuve.

•We can also make specially to order with double rising front. £12 12 0 Code Word-Sosextra.

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, LONDON, S.W.

The Sinclair Collapsible Lens Hood

Gives Brilliant Negatives.



The tendency to use collapsible cameras has, in many instances, led to deterioration in the quality of the negatives obtained, and flat, foggy and indifferent results are often caused through a flood of useless light entering the camera, and being reflected from the surface of the bellows or woodwork on to the plate. Professional photographers have for a long time recognised the value of a hood on their lens, or the use of a black shade or shield. The difficulty in the way of such appliances for field cameras has been the bulk of such accessories, and moreover the lack of effective adjustment.

The Sinclair Lens Hood is adjustable, and may be partially extended when using wide-angle lenses.

The Sinclair Lens Hood is small and may be carried in the waistcoat pocket.

The Sinclair Lens Hood is invaluable for contre jour effects.

The Sinclair Lens Hood prevents flare, and greatly enhances the brilliancy of negatives.

The Hood may be instantaneously attached or removed from the lens. Size for lenses up to $1\frac{7}{8}$ in diameter, when closed $3\frac{1}{2} \times 3 \times \frac{18}{16}$. Weight 2½ ounces. Price 12/6 net. Code Word-Spartina.

Send piece of paper circumference of lens tube when ordering.

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket,

Sinclair's Real Image Finder, with Rising Front.



We designed this Finder specially for our 1-plate "Una" Camera and it can be recommended for any instrument. It consists of a metal box in which there is a mirror, set at an angle of 45°, reflecting the image projected from the front lens on to the ground glass on the upper surface. A groove in the top of the Finder takes metal masks, which can be had of different sizes, showing the view given by any particular lens. The lens of the Finder is arranged in a rising front which can be marked to correspond with the rising front of the hand camera. The rise is

equal to a quarter of the given image. The Finder is readily cleaned and is supplied with two masks, one giving the same image as that of an 8 inch lens and the other that of a 14-inch lens on a half-plate. The masks are reversible and can be used for vertical or horizontal views.

Sinclair's Small Real Image Finders, without adjustable masks or rising front, with swing fitting for vertical or horizontal views.



Sinclair's Brilliant View Finders.

Sinclair's Brilliant Finder as used on our "Una" Hand Camera with revolving mask for vertical and horizontal pictures and swing fittings for turning on slide............

Sinclair's extra small Brilliant Finder with levels attached 8/6

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, LONDON, S.W.

THE Sinclair Hand Book of Photography.

is the Best Guide and Reference Book.

Edited by JAMES A. SINCLAIR, F.R.P.S.

The success of our Photographic and Optical Guide, which, in addition to being a catalogue, was prefaced by a number of articles by the most notable workers in their special departments, has led us to amplify these articles and to add others so that they form an invaluable guide to the beginner, and may be read with profit by the

Synopsis.

Hints on buying Cameras, Taking the first Photograph, The Dark-Room and its Illumination, Development of the Negative, Printing in various processes, Lantern Slide making, as well as the following special articles on particular branches of photography.

Hand Cameras: Their Selection and Use. By JAS. A. SINCLAIR, F.R.P.S.

The Camera at Home. By E. T. Holding. Illustrated.

The Art of Intensifying and Reducing Negatives. By I. McIntosh (Secretary of the Royal Photographic Society).

Bromide Printing and Developing. By J. STERRY, Hon. F.R.P.S. The Gum Bichromatic Process. By J. C. S. Mummery, A.R.I.B.A., F.R.P.S. (President of the Royal Photographic Society).

The Rawlins' Process of Oil Pigment Printing (Illustrated).

By Robert Demachy, Hon. F.R.P.S.

The Bromoil Process. By C. H. Hewitt, F.R.P.S.

The Ozobrome Process. By Thomas Manly, F.R.P.S.

Oil Ozobrome-A Simplified Oil Process. By Thomas Manly, F.R.P.S.

The Autochrome Process of Colour Photography. By R. CHILD BAYLEY (editor of Photography and Focus).

Flash Light Photography. By F. I. MORTIMER, F.R.P.S. (Editor of the Amateur Photographer).

The Hand Camera and its Possibilities. By JAMES A. SINCLAIR, F.R.P.S.

Carbon Printing. By HENRY W. BENNETT, F.R.P.S. Law for Photographers. By E. B. V. CHRISTIAN, LL.B.

General Photographic Hints, Formulæ, etc.

With or without General Catalogue Price 1/- Post-Free.

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket,

Sinclair's Dark-Room Blinds



This fitting consists of a well-made varnished wood frame with two grooves, in which red and black blinds travel, and when both are down no trace of white light is admitted. The red blind alone is useful for bromide printing and handling various sensitized papers, but for developing the constancy and safety of a lamp is to be preferred, and for this purpose the black blind is also drawn down. We make the fitting to any measurements, and we shall be pleased to give quotations on application. Screws are supplied with the blind, and all that is necessary is to screw it to the window frame.

Specimen Size and Price.

		£3 10	_
2.7	7 ft. × 4 ft.	£4 4	0
	Quotations	given for any size	

JAMES A. SINCLAIR & Co., Ltd. 54, Haymarket, LONDON, S.W.



Sinclair's 'Efficient' Lamp

is the

BEST LAMP for OIL or ELECTRIC LIGHT.

- "A dark-room lamp really satisfactory in use."—British Journal of Photography.
- "A piece of apparatus it is difficult to see how to improve."—
 Photography.
- "Well worth the money."— Amateur Photographer and Photographic News.

We have specially made this lamp for those wanting a really reliable lamp, whether for oil or electric light. It is a large lamp; but the larger the lamp the better, provided it is fitted with a safe light. Instead of the usual badly-made oil reservoir and worse burner in the ordinary commercial articles, we have a large oil reservoir made from solid drawn metal, and which is consequently unleakable. The burner is a best quality duplex, and the two wicks being actuated from the outside, the light can be of great or little intensity at will.

The front of the lamp slopes so that the light is thrown down on to the work table, and carries any combination of non-actinic material in three grooves—one of which is wide enough to take a thick glass Wratten Safe Light, 12×10 in size. Both sides of the lamp have grooves, each holding two fabric frames, yellow and ruby, $8\frac{1}{2} \times 6\frac{1}{2}$ inches, and on one side the groove is arranged in a door which may be opened if white light is required for exposing or any other purpose.

When arranged for electric light, a double bayonet electric fitting is connected with a reversible switch, thereby enabling the operator to have either a white light on the top of the lamp, or the usual light from the inside of the lamp as desired.

Price, with Oil F	Reservoir and best	Duplex B	urner, as			
Ditto, fitted for El	ectric Light, giving				1	0
				1	5	0

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, LONDON, 8.W.

Sinclair's Tropical Folding Lamp.



This lamp is of a well-known form, but consists of a folding fabric frame, yellow inside and ruby outside, with the top and bottom of the lamp drawn out of **solid copper**. Consequently the lamp does not rust, and no light leaks from the corners.

Supplied in cloth-covered case large enough to hold four lights in addition.

Price 2/6
A cheaper form in Russian iron, price 1/0

Sinclair's Tropical Devolights.



These lights give a powerful light far better than the usual night-light. They are made of very hard wax, which does not melt or run during transit in tropical countries. The metal tins holding the lights are made of drawn metal.

Price

2d. each, 1/9 per box of twelve.

Sinclair's Improved Drying Rack.



Most Draining Racks are not well suited for drying plates. The "Ideal" Rack is the best for draining and drying, and will be welcomed in every dark-room. The grooves are wide apart, and are so cut that, although the plate is held perfectly, yet air can get to the extreme edges. It will take 21 plates and is suitable for Lantern size to $8\frac{1}{2} \times 6\frac{1}{2}$. Larger sizes may be had to order.

Price 4/0 each.

Sinclair's "Compact" Changing and Developing Tent.



A Carrying Case and Changing and Developing Tent in one.

Invaluable for the Traveller.

Every traveller and tourist knows the trouble of the dark-room. The ones placed at his disposal at hotels and on board ship are often more remarkable for the amount of light they let in, rather than for the quantity they keep out. Even if he wishes to change his plates in a bedroom at night, he will often find a piece of glass over his door preventing him effectually shutting out light from a corridor outside. The Compact Tent removes every difficulty, and when not in use as a dark room will hold camera, slides or plates. The window is then replaced by a metal plate. Made in three sizes—\(\frac{1}{2}\)-plate, \(\frac{1}{2}\)-plate, and \(\frac{1}{2}\)-plate,

For Plates.	Size.	Weight.	Price in Imitation Leather.	Code Word.	Price in Leather.	Code Word.
$4\frac{1}{4} \times 3\frac{1}{4}$ $6\frac{1}{2} \times 4\frac{3}{4}$ $8\frac{1}{2} \times 6\frac{1}{2}$	$8 \times 5 \times 8\frac{3}{4}$ $12 \times 7\frac{1}{2} \times 11\frac{1}{4}$		£2 0 0	Sotaque Sotavento Soteribus	£2 10 0	Soterrais



Sinclair's Dark=Room Watch

For Time Development.

This watch has the dials so arranged that one revolution of the large hand is made in one minute, and the divisions are divided to 1th second. The smaller hand records the minutes up to 30 minutes. One pressure of the winding knob starts the watch, a second pressure stops it, while a third re-sets the hand at zero.

Price 25/0

"Lustros Sinclair's



For giving richness and depth to Photographic Prints.

This preparation is conveniently put up in tubes, and is guaranteed

made from the finest and purest ingredients.

It is for use on all kinds of photographic prints,—platinotype, carbon, bromide, and other silver prints, but must not be used on oil prints.

It adds brilliancy to the prints and imparts depth and transparency to the shadow details

It forms a perfect protecting surface and enhances the permanency of silver and bromide prints, which are liable to be affected by and deteriorate under the influence of damp and impure air.

Directions.

Sufficient of the preparation should be squeezed out on to a clean dry rag, and rubbed quickly and evenly over the print. Allow a few seconds to elapse, then polish off with a soft, dry and fluffless cloth.

In Tubes-Price Sixpence.

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, LONDON, 8.W.



This lamp consists of a light aluminium box which holds a battery connected with a piece of platinum wire. The flash powder laid in the lid of the box is fired on pressing a button at the end of the flexible cord, the light from the incandescent platinum being conveyed to the powder by means of touch-paper matches. It is simple, rapid and sure.

Price, complete with 50 matches.

6/6 with dry battery.

6/9 with export battery, which only requires water before use.

Extra Batteries, 1/0 each. 100 Matches, 7d.
The 'Agfa' Powder is recommended for this lamp.



Sinclair's "Regent" Magnifier.

Sinclair's "Regent" Focussing Magnifier is the most useful magnifier for general use. When extended it is of sufficient length for use with hand cameras and stand cameras with focussing hoods. Each instrument is sent out in a leather pocket case. Length closed, 2% in.; length open, 4% in.

Price 12/6

Closed. Open.

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, London, S.w.

Sinclair's Watertight Metal Cases for Photographic and Scientific Outfits.

Where outfits are required for hot and moist climates we especially recommend "Una" Water-tight Cases. These cases will preserve apparatus indefinitely, and are absolutely reliable. Each case is made of steel, heavily japanned, and is fitted with one or two 3-lever locks. When specially made for outfits consisting of camera, slides, etc., for say, ½ and 1/1-plate sets, the approximate cost is £3 10s.

Standard sizes can be had for uniform cases, the inside being without divisions or unlined at the following prices:—

24 in.	 27 in.	 30 in.	 33 in.	 36 in.
44/6	 53/4	 62/3	 80/0	 98/0

We guarantee that each case has been tested by filling it with dry sawdust, closing it and immersing it bodily in water for at least an hour. Any case that shows any signs of damp is rejected.

Extraordinary Recovery of Valuable Outfit through using one of our "Una" Cases.

His Excellency Capt. F. R. Barton, writes from Government House, Port Moresby, British New Guinea, on September 5th, 1905.

"The full plate camera which I bought from you has been recovered. From the end of February last to early in June this camera, contained in the water-tight box you made for it, drifted about the ocean, and it was eventually washed ashore at York Island, and was there found by some natives who took it to Thursday Island. You will be astonished to hear that in spite of its long immersion, the whole apparatus inside the box was found, when the latter was opened, to be absolutely undamaged; not even the remotest trace of damp having found its way inside."

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, London, S.w.

THE OIL AND BROMOIL PROCESSES.

Sinclair's Oil Pigment Brushes. (Genuine "Putois pied de biche")

The quality of the Brush is as important as the quality of the ink. All sorts of brushes have been recommended, but we believe that there is nothing to equal the brushes recommended by M. Demachy. These

are made from the hair of the pole cat, and the hair is arranged in the making so that on the bevel it is beautifully domed. Consequently with a large brush it is quite possible to do small fine work. Our prices for these brushes are exceedingly low. For a beginner purchasing only one brush we recommend one of the larger sizes, but an equipment of several will be found very advantageous, a clean or dry brush being frequently in demand.

*No. 3, 1/4 No. o, 11d. *No. 8, 3/-No. 14, 6/6 *No. 5, 1/9 *No. 10, 4/-No. 18, 10/6 No. 1, 1/0 No. 2, 1/2 No. 7. 2/6 No. 12, 5/-No. 33, 30/-

Extra small size for detail work...A, 3d. B, 4d. C, 5d. D, 6d. *Nos. 3, 5, 8 and 10 are also supplied "straight cut" for use with the "Hopper."

The "Mortimer" Brush.

This brush is made of long and fine hog hair, shaped like our Fitch brushes, and will be appreciated by those who desire broad effects. It is used by the Editor of the Amateur Photographer.

No. $1-\frac{3}{4}$ inch 5/- No. $3-\frac{1}{4}$ inch. 8/-No. 2—1 inch 6/6 No. 4—11 inch 10/-



This hopper will take any brush from No. 1 to No. 10. Adjustable grip and polished wood handle, 1/0.

Hopper Brushes-

No. 3, 1/4; No. 5, 1/9; No. 8, 3/0; No. 10, 4/0.

Sample Outfits. (For Prints 6½×4¾ inches.)

For the Oil Process.

r No. 8 Brush; I "B" Brush; I Pot Pigment; I Tube Medium: 1 packet Oil Pigment Paper: 1 Bottle Spirit Sensitizer, 6/8

For the Bromoil Process.

I No. 8 Brush; I "A" Brush; I doz. Bromide Paper; I Bromoil Solution; I Pot Pigment; I Tube Medium, 7/0.

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, LONDON, S.W.

For Oil and Bromoil Work Use SINCLAIR'S PERMANENT PIGMENTS.

In Pots or Tubes.

Do not drag on the brush. Are made in a variety of permanent colours. Are very brilliant. Are rapid in action. Dry quickly after the support has been dried.



The composition of most of the litho graphic printing inks used for the oil pigment process has caused many beginners to believe that success could only be obtained after the expenditure of much time and trouble. Such inks, often used in conjunction with entirely unsuitable brushes, cover the print with broken hairs and dirt, and are, moreover, so slow in action that all spontaneity is lost in the laboured print. While we admit that there is no royal road to success with the oil process, yet with suitable inks and suitable brushes the technics can be mastered after one or two

The success of our Pot colours has been exceedingly great, and the majority of users appreciate them because of their great depth and richness of effect. Perhaps their only defect is the drying which takes place as they age, and, although they can always be worked up with medium on can a ground glass palette, some of our friends object to this labour. We are, therefore, putting our colours in tubes as well as in pots, but to do this have to slightly reduce the consistency. Tube colours will be found just as good as pot colours for all ordinary work, but in cases where very great depth and strength is desired, pot inks are preferable.

Pigments in Pots.

Standard Black Brown Black Payne's Grey Burnt Sienna Red Chalk * "Encre Machine," a hard ink

Italian Green Warm Sepia "Encre Machine," a hard ink
"Encre Taille Douce," a soft ink which may be mixed with the "Encre
Machine" Price 1/0 per pot.

The last-named are those used by Messieurs Robert Demachy, Puyo and other

celebrated workers of the French school. Special Inks for Colour Effects.

A number of workers are very interested in getting effects in colour, and in response to many demands we have added the following to our list:—
Yellow. Antwerp Blue. Raw Sienna Permanent Crimson.

Price 1/6 per pot

Foliage Green. Price 2/0 per pot.

Pigments in Tubes.

Tube Inks are supplied in the following colours only :-

Italian Green Burnt Umber Indigo Brown Black Warm Sepia Burnt Sienna Price 1/0 per tube.

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, LONDON, 8.W.

SINCLAIR'S "HEWITT" Pigmenting and Retouching Desk.



The Best Desk for Oil and Bromoil Work.

The Best Desk for Spotting,

The Best Desk for Retouching.

The Best Easel.

The Best Desk for Trimming Prints.

Although primarily intended for pigmenting Oil and Bromoil Prints, this desk will be found an exceedingly useful adjunct in every workroom.

The "Hewitt" Desk is, in general form, like a retouching desk with a substantial base, containing a large drawer, 19 × 19 × 1½ inches, in which all requisites for pigmenting, spotting and retouching may be kept.

The hinged frame above the base holds a sheet of plate glass, 18×18 inches, and this glass supports the wet blotting paper on which the print is placed for pigmenting at a convenient angle. Above the frame and attached to it by sliding hinges, so that it may be removed when desired, is a cover, consisting of a mahogany frame in which is recessed a sheet of metal. When this cover is closed over a wet oil or bromoil print the moisture is retained, and the print may be kept in good condition for days, should it not be possible to ink it immediately.

The "Hewitt" Desk for Retouching. A sliding bar, which clamps on to the framework of the desk, may be adjusted to any desired position for supporting negatives resting on the plate-glass surface and converts the apparatus into an exceedingly rigid and effective retouching desk. A sheet of white paper on the base of the desk forms an admirable reflector for reflecting light through the negative.

The "Hewitt" Desk for spotting prints or as a work-room table. For this purpose the plate-glass is removed and a board supplied is fitted in its place. An excellent and clean desk that may be used flat or at a convenient angle is at once secured.

The "Hewitt" Desk as an Easel. The work being finished, the desk may be set nearly vertical and the print is examined in comfort. Mounted prints are supported by a ledge at the bottom of the desk.

For many purposes the "Hewitt" Desk will be appreciated. It is exceedingly handy for trimming, mounting, or indeed any work-room purpose where a clean table or desk is necessary.

The "Hewitt" Desk, made in polished mahogany, with 18×18 plate glass, adjusting carrier, plain board, for table and cover as described,

£1 11 6 Nett Cash.

JAMES A. SINCLAIR & Co., Ltd., 54, Haymarket, LONDON, S.W.

Fourth Edition.

Revised and Enlarged.

How to make Oil and Bromoil Prints.

In it the Rawlins Process of Oil Pigment Printing is described by Monsieur Robert Demachy, the leading French exponent of Oil Printing, and the Bromoil Process is treated by Mr. C. H. Hewítt, F.R.P.S., while Mr. Thomas Manly, F.R.P.S., describes a simplified oil process.

With Two Portraits and Four Comparative Illustrations.

"Just what the oil printer should have at his hand since it gives the advice of a master-worker without unnecessary words."—British Journal of Photography.

"Useful not only to a beginner, but also will give valuable hints to those who are not novices in the process."—Amateur Photographer and Photographic News.

"Its instruction is all terse and practical." -- The Photogram.

PRICE SIXPENCE, POST-FREE.

Sinclair's Opaque Screen.



Every lanternist knows the value of opaque screen, which greatly hances the brilliancy of the result. most convenient form of mounting is that adopted with Sinclair's Opaque posed of a closely woven fabric, distempered mounted on roller with cord and pulleys, which enable it to be easily rolled up and down. The lath which holds the screen from the top has a hole at

either end through which a cord may be placed to hang on nails from a wall, or from an ordinary window curtain pole. When rolled up the screen is efficiently protected from dust by a waterproof covering.

6 ft. 7 ft. 8 ft. 9 ft. 10 ft. 12 ft **20/0 .. 22/6 .. 25/0 .. 30/0 .. 40/0 .. 55/0**

Larger Sizes to order.



Sinclair's No. 2 "Owen"

OPOMETER (PATENT).

The Perfect Range Finder.

. .

"This Remarkable Instrument."—The Broad Arrow.

"The Ideal Range Finder. This beautiful instrument combines the 'desiderata' of lightness, portability, simplicity and accuracy.— War Office Times and Naval Review.

"That this clever invention will meet with the success it undoubtedly deserves would appear a foregone conclusion."

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Some advantages and Uses of the Topometer.

MILITARY.

The Topometer can be used or taking ranges and dimensions of any distant object with great exactness by one man.

The Topometer registers the ratio of distance to base, and makes the base at the point observed.

The Topometer will measure the distance of an object without

the observer having to move in a lateral direction.

The Topometer may be used as a Depression Range Finder, without the necessity for a pedestal or levelling.

The Topometer during attack, when, owing to enemy's fire, only a momentary observation is possible, will give the range without the necessity for leaving cover.

NAVAL.

The Topometer may be used as a Range Finder from a fighting top.

The Topometer may be used from sea level when attacking permanent land fortifications.

permanent land fortifications.

The Topometer is the best instrument for Station Keeping and

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The Topometer is unrivalled for rapid sextant work when it is advantageous to avoid the delay of consulting mathematical tables.

SURVEYING.

The Topometer used with a Plane Table is the best instrument for Rapid and Accurate Survey Work.

THE TOPOMETER DOES NOT NEED A DEFINITE BASE,
MATHEMATICAL TABLES OR DIFFICULT CALCULATION.

Weight in case complete, 2½ lb. Price 26 6 0 Nett Cash.

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James A. Sinclair & Co., Ltd., 54, HAYMARKET, LONDON, S.W.

Chas. Zimmermann & Co.

(PHOTOGRAPHIC) LTD.

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" Poisonable,
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SOLE BRITISH AGENTS FOR

THE "AGFA" — DEVELOPERS, PLATES, FILMS, CHEMICALS, ETC.

ERNEMANN'S CAMERAS.

FOCAL PLANE, HAND, STAND AND STUDIO.



Crossed Sword Papers, Albumen, Collodio and Gelatine P.O.P., Bromide and Gaslight Papers and Post-Cards, Albumat and Protalbin.

RODENSTOCK'S ANASTIGMATS and LENSES for all purposes.

HEINRICH'S GELATINES.



RODINAL

The Most Active and Best-Keeping Developer.

A highly concentrated Solution only requiring the addition of water.

- It does not affect the fingers.
- It can be used over and over again.
- It will stand more dilution than any other developer.
- It is controlled by the amount of dilution.
- It is Rapid, Slow, Hard or Soft in action at will.
- It can be used with advantage on any sort of plate.

It does not stain or fog.

IT CAN BE USED FOR

PLATES, FILMS, BROMIDE or GASLIGHT PAPERS, ENLARGEMENTS,

LANTERN SLIDES, ENLARGEMENTS, TANK or any method of Development.

PRICES .. 3-0z. Bottle, 1/4; 8-0z. Bottle, 2/8; 16-0z. Bottle, 4.8.

Of all Dealers and Chemists.

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic), LTD., 9 and 10, St. Mary-at-Hill, London, E.C.

READ THE

AGFA Developers

ARE PURE AND RELIABLE.

Insist on having AGFA Brand in Substance. Cartridges or Solution.



Amidol-Agfa
Eikonogen
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Hydrokinone-Agfa
Imogen-Sulphite
Metol-Agfa
Ortol-Agfa
Pyro-Agfa
Paramidophenol-



Agfa

For full particulars of Eikonogen and Imogen Sulphite see following page.

All Photographers, whether amateur or professional, should read the AGFA HANDBOOK, over 100 pages of figures, facts, and formulæ on Developing, Intensifying, Reducing, Printing, Toning, etc., etc.

1910 Edition ready in March.

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic), LTD., 9 and 10, St. Mary-at-Hill, London, E.C. AGFA HANDBOOK.

Eikonogen. Agfa.

A Developer especially indicated for Studio and Artificial Light Negatives, as it softens down extreme contrasts, producing a harmonious negative beautifully graded and rich in detail. It is used either with a potass. or soda accelerator, in one concentrated or separate solutions. It keeps well.

I-oz. $tin 1/0 \dots 4-oz. tin 3/2 \dots 8-oz. tin 5/6 \dots 16-oz. tin 10/5$

Imogen Sulphite. Agfa.

The simplest of all Two-Solution Developers, it being simply dissolved in water, and only requiring the addition of a solution of Household Soda.

It works clearly and brilliantly. It does not affect the fingers or the emulsion. It keeps well, in solution or dry, and is strongly advocated for negative and process work. Its action resembles that of the old iron developer.

I-oz. bottle 7d. 4-oz. bottle 1/8. 8-oz. bottle 3/0 16-oz. bottle 5/4

THE AGFA

Neutral Toning & Fixing Salt.

This is quite an innovation in the way of combined baths, obviating the dangers of this manner of toning. These dangers—double toning, sulphur toning, and undue reduction of the printed-out image—are due to the acidity of the bath. This acidity becomes impossible with our neutral bath.

Another danger is that of completion of toning before fixation. This does not occur with the "AGFA" Salts, as toning does not commence until five or six minutes after the print has been immersed in the bath, the consequence being that the print is fully fixed out before toning is complete.

When exhausted the bath ceases to tone. It is suitable for collodio-chloride, gelatino-chloride, and albumenized papers and post-cards. At 6d. 9d. 1/2

In Tins for 9 18 36 ozs. of Solution.

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic). LTD., 9 and 10, St. Mary-at-Hill, London, E.C.

The Agfa Intensifier (Mercuric).

Agfa Intensifier does not stain, but gradually builds up the image by the deposition of mercury, giving a permanent intensifica-

tion greater than that obtainable with mercuric chloride.

To use, I part of the solution is diluted with 9 parts of water, and the negative to be intensified immersed. Intensification commences at once, and proceeds regularly and slowly for about 10 to 15 minutes, when maximum intensification is reached. The plate is then washed and dried, and the process is complete. This intensifier acts remarkably well in the wet plate process.



Prices. 2 oz. .. 1/0 8 oz. .. 3/0 4 oz. .. 1/9 16 oz. .. 5/0

The Agfa Copper Intensifier

and Toning Salt for Bromide Papers and Lantern Slides.

For Plates, Films, and Bromide Papers. Only requires dissolving in water. Complete Intensification in one Manipulation. Contains no scheduled poison. Can be obtained at any dealer's.

Patent measure stopper bottle, about 2 Oz., 1/6.

Tones Bromide Paper and Lantern Slides a beautiful red.

The Agfa Reducer.

A useful and novel preparation, which merely requires dissolving in water to be ready for immediate use.

The negative or positive that requires reduction is immersed in this solution and reduction takes place regularly and at a fair pace, but not too quickly to prevent the action being stopped when sufficient reduction has taken place. The plate is then washed and the process completed.

It can be used for Bromide Paper as well, but it is desirable to add twice the amount of water. It is also of great value to

users of wet plates.

Prices.

Or, 10 cartridges, each sufficient for 3½ oz. solution

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OF THE AGEA HANDBOOK.

The AGFA

Chromo-Plate and Film.

Yellow and Green Sensitive.

SPEED, 200 H. & D.; 294 WATKINS; 109 WYNNE.

NO YELLOW SCREEN REQUIRED.

This is a dry plate of a high general sensitiveness, possessing the enormous advantage, that while the emulsion is quite as sensitive to the blue as ordinary plates, it is extraordinarily sensitive to the yellow and yellow-green rays, so that a negative of a subject in which these rays are present is represented in very full detail without the use of a yellow screen.

The Agfa Chromo Plate therefore produces a negative far richer in detail and tone values than it is possible for any ordinary plate to produce, especially in landscapes, where the yellow, and particularly the yellow-green rays predominate; as these colour values are preserved and reproduced without a screen, which of necessity prolongs the exposure, the Agfa Chromo Plate has the further advantage of producing this correct value with a very short exposure, thus precluding the danger of movement.

No very particular care is necessary as regards dark-room illumination with these plates; a good red lamp is all that is wanted, and the plate should be kept in the shadow as much as possible.

The Agfa Chromo Emulsion can also be obtained on flat cut films of sufficient thickness to prevent curling, but offering a very considerable advantage as regards weight.

Prices.

				1 11005	•				
		Plates.		Films.			Plates.	F	ilms.
31×41-P	late	 1/8		2/6	$6\frac{1}{2} \times 4$	3 4 ··	3/0		4/4
5 ×4		 2/4	٠	3/4	$8\frac{1}{2} \times 6$	· ·	6/4		9/4
$5\frac{1}{2} \times 3\frac{1}{2}$		 2/7		3/6	10 × 8		10/0		14/0
$6\frac{3}{4} \times 3\frac{1}{4}$	1)	 2/8		3/10	12 × 10		14/4		17/6

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ASK YOUR DEALER

The Agfa Isolar Plate and Film.

(Antihalation).

GRADES, Ordinary and Orthochromatic.
SPEED, 100 H. & D.; 147 WATKIN; 77 WYNNE.

THE ISOLAR PLATE is quite unique. Halation is prevented by means of a non-actinic (red) film between the emulsion and the glass, this film intercepts the light before it reaches the glass, and again before the reflected rays reach the emulsion, thus all the light that passes through the emulsion has to pass and repass the red film; by the time, therefore, it reaches the sensitive silver it is perfectly harmless.

THE ISOLAR PLATE, therefore, has great advantages over backed plates; in the first place, there is absolutely no chance of reflection (the cause of halation), and secondly, there is no fear of spoiling the sensitive surface with the messy backing, and again, there is no fear of making a lot of dust in the slide, thus escaping the pinholes so common to backed plates, especially when used in a magazine Camera, or changing box.

The red colouring of the film disappears entirely in the processes of developing and fixing, without any further manipulation whatever.

The emulsion is rapid (100 H. & D.), and gives brilliant fine grain negatives. It can be supplied "ORDINARY" or "ORTHOCHROMATIC."

A special ISOLAR POSITIVE PLATE is also supplied, and it is surprising how "plastic" are reproductions on this plate. It cannot be too strongly urged in this direction that the majority of lantern slides are spoilt by halation, this is quite absent in the Isolar Lantern Plate, and the result is a brilliant stereoscopic effect.

The plate bears forcing without fogging, and has most exceptionally good keeping qualities.

	P	rices.				
Plates.			Plat	es.	File	ms.
	o. Ord. Ortho.		Ord.			
$3\frac{1}{2} \times 4\frac{1}{2} \cdots \frac{1}{11} \frac{2}{1}$	2/9 3/0	61×43	3/5	3/9	5/0	5/6
$5 \times 4 \cdots 2/7 2/1 5\frac{1}{2} \times 3\frac{1}{2} \cdot 2/7 2/1$	1 3/10 4/3	$ 8\frac{1}{2} \times 6\frac{1}{2} \dots $	7/3	7/10 1	10/5	11/6
$6\frac{32}{4} \times 3\frac{1}{4} \dots 3/0 3/4$	5/0 5/6	10 ×8	11/5	12/7		
4.134 11 0/0 0/4	3/0 3/0	12 X 10	10/0	17/7		

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic), LTD., 9 and 10, St. Mary-at-Hill, London, E.C.

FOR THE AGFA HANDBOOK.

AGFA FLASHLIGHT.

A New and Efficient Powder.

Minimum Smoke Development.

Highly Actinic.

Maximum Light Intensity
Rapid Combustion.

Small Charge.

Absolutely Non-explosive.

Convenient Packing (with Measure). Keeps Indefinitely.

Per Bottle, 1/0, including special Measure and Ignition Paper. Also in Bottles at 2/0, 3/3, 5/3 and 12/0. Containing 25, 50, 100, 250 grammes.

Repeated flashes can be given without inconvenience, owing to the very slight development of smoke, which occurs as a thin bluish mist only.

The powder is non-explosive. It can be fired electrically, or by hot wires, or touch paper. The flash is very rapid, about 1/120th.

THE AGFA EXPOSURE METER.

For determining the correct exposure for any speed plate For Daylight or Flashlight.

THE AGFA RAPID FIXING SALT.

By simply dissolving this salt in the given quantities of water an Acid Fixing Bath is produced which possesses two most important advantages over any other acid Fixing Salt at present known.

Firstly it fixes out the unaffected silver very much more rapidly than any other acid bath.

Secondly, the time of fixing is not so materially affected with the progressive use of the bath as is usual with other mediums, and it is only necessary to immerse a plate in this new bath about half the time that would be necessary in the usual Hypo Bath. The advantages of the new bath also appear in that, whether it is being used for the first time or after the fixation of a number of negatives, the time of fixing is not remarkably prolonged.

Original Tins.

 Size 1
 Size 2
 Size 3
 37 ozs.
 75 ozs. of Solution.

 Sufficient for 90 negatives 180 negatives.
 \$\frac{1}{2}\$-plate
 \$\frac{1}{2}\$-plate
 \$\frac{1}{2}\$-plate

 Retail Prices: 5d.
 9d.
 \$\frac{1}{4}\$

Cartridges hermetically sealed.

Contains sufficient for 100 cub. cent. of Fixing Bath to fix 25 1-plate negatives. Retail Price per box of ten, 2/3.

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic) LTD., 9 and 10, St. Mary-at-Hill, London, E.C.

GET A FREE COPY



This is really a Camera that will go into the pocket.

It is the smallest and most completely equipped Camera of its size.

It is dainty and beautifully finished. It is strong, serviceable and efficient.

The Camera is made in models ("A" and "B") according to the following specifications :-

Prices complete with 3 Slides and Film Pack Adapter. Model A. (Single Extension, without Rack.)

The Shutter is the usual between Lens pattern, giving Time, Bulb and I second, 1/2, 1/5, 1/25, 1/50 and 1/100 of a second instantaneous exposures.

3 10 0 With F/6.8 Aplanat.... With F/6 Anastigmat..... 5 10 0 6 10 0

(Double Extension, with Rack).

Scaled for the complete lens and for the back combination only.

It is fitted with a special compound sector shutter working at Time, 1/2, 1/5, 1/25, 1/50, 1/100, 1/200 and 1/300th, and opening for focussing.

With F/6·8 Aplanat... **£4** 5 0 ... With F/6 Anastigmat **7** 5 0 ... 1-plate $5\frac{1}{2} \times 3\frac{1}{2}$ 5 0 0 ... 8 10 0 ... 9 5 0 11 0 0

Both Cameras have Automatic Finders which open when the Cameras are opened,

and close when the Cameras are closed, automatically, and a Spirit Level.

They are built of Wood and Aluminium with Nickelled fittings and Red Leather Bellows the outside covered with real Morocco Leather,

A Focal Plane Shutter to slide on the back of either model can be supplied, giving Instantaneous exposures up to 1/2000 of a second. 1-plate, 45/0, 1-plate, 68/0
Three extra Slides may be substituted for the Film Pack Adapter if desired.

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OF THE AGFA BOOKLET.



The new focal plane shutter fitted to this camera is admittedly the finest shutter of this type. All movements are adjusted from outside. It is a simple "two-roller" shutter, free from vibration. It is fitted with a time movement. It will give the most rapid exposure at

present obtainable, up to properly of a second.

We are now fitting a timing movement, giving any exposures by finger pressure.

The camera is most strongly made and elegantly finished in dull ebonized wood and morocco leather.

The special system of 1 piece struts to extend the front gives the latter an extremely solid and steady support.

The beliows are of leather, lined with calico, and are stout and permanent.

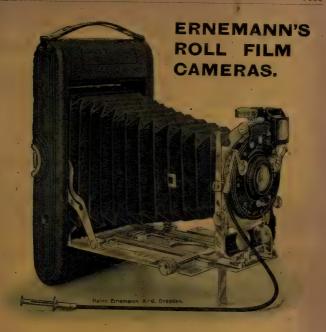
The front has rising and cross movement.

The camera has bushes for oblong and upright pictures.

PRICES

With Three Double Slides (Wooden).		FOR PLATES.													
		Inches.		Inches. 34×44.			nche 4 × 5.			iches		STEREO.			
Camera, complete without lens Ditto, with Ernemann Double	£ 5	s. 5	d. 0	£ 6				s. 17			s. 8	d. 6	£ 7	s. 19	d.
Anastigmat f/6.0 Solid leather case Changing Box	0				15 15 12	0 0 6	10 0 2	5 18 19		11 1 4	15 1 2	0 0 6	14 1 3	10 1 6	0 0 0

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic), LTD., 9 & 10, St. Mary-at-Hill, London, E.C.



The handiest and most highly finished on the market. Made entirely of metal. Finest leather-covered. Nickelled metal parts. U-form lens board. Aluminium baseboard. Ernemann Shutter giving T., B. and I sec. to \$\frac{1}{10}\$ of histantaneous. Horizontal and vertical movements to lens. Scale for focussing. Two bushes. Brilliant finder and level. Antinious release. Automatic take-up to bellows.

Model I. For films, $3\frac{1}{4} \times 4\frac{1}{4}$, and $\frac{1}{4}$ -plates with rack focus to single extension. Model II. For films, $5\frac{1}{2} \times 3\frac{1}{2}$, and ditto plates with double extension and rack focusing.

Model III. For films, $3\frac{1}{4} \times 4\frac{1}{4}$, and $\frac{1}{4}$ -plates with rack focus and double extension.

P	R	I	C.	D	S	

	Model I.			Mo	Model II.				Model III.			
With f/6.8 Aplanat	£4	5	0	£6	0	0		£5	10	0		
,, f/6 Anastigmat (air space) ,, Special Cemented Anas-	6	15	0	9	5	0	1	8	0	0		
tigmat, f/6.8 Extra for Focussing Screen and	7	15	0	10	5	0		9	0	0		
three slides		9	0	0	9	0		0	9	ø		

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic), LTD., 9 and 10, St. Mary-at Hill, London, E.C.



The "Smallest of All" Roll Film Camera.

For Film Spool No. o.

Size of Picture, $1\frac{1}{2} \times 2\frac{1}{2}$

Single Extension. T.B., 1, $\frac{1}{2}$, $\frac{1}{5}$, $\frac{1}{25}$, $\frac{1}{50}$ and $\frac{1}{100}$ th of sec. Shutter.

Made entirely of Metal.

Aplanat f/6 8 lens, giving exquisite detail.

Reversing Finder. Two Bushes.

Real leather cover.

PRICE £3 0 0

The Tiny Stereo Roll Film Camera.



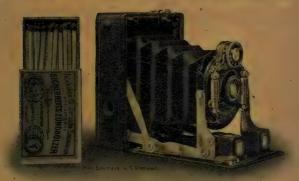
For Roll Films, Spool No. o, Taking Stereo Pictures 45 × 107 mm. Made entirely of Metal, Infinity Stop, Automatic Everset Shutter giving speeds as above, or with Simple Auto Shutter 3 speed T and B, Brilliant Finder, Black Leather Bellows, Simple Film Holders. Takes Plates or Film.

PRICE.		Simple
With accurately paired, f/6.8 Aplanats.	. £4 15 0	Shutter.
1 / f/6 Anastigmat	s 950	8 10 0

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic), LTD., 9 and 10, St. Mary-at-Hill, London, E.G.

ERNEMANN'S

Vest Pocket Camera.



Model I. with fixed focus. Model II. with focussing adaptment.

The Smallest, Neatest and Lightest Camera on the market. Made of Metal throughout.

On opening the Camera the lens springs immediately to the infinity focus point.

The Shutter is of the well known design that requires setting, and gives exposures of T.B., 1, $\frac{1}{2}$, $\frac{1}{15}$, $\frac{1}{125}$, $\frac{1}{50}$ and $\frac{1}{100}$ th of a second.

Model I. gives an infinity focus (fixed focus) only.

Model II. is fitted with a lever by means of which the Camera

can be focussed from infinity to 4½ feet.

The pictures are exquisitely sharp and bear considerable enlarge-

The Camera is leather-covered with nickelled fittings, and is priced complete with three single metal slides.

Size of picture, 13×23.

	PRICES.			Model II.
With f/6.8 Aplanat		55/0		65/0
,, f/6 Anastigmat	(Air space)	95/0		105/0
Changing Base for Cal	(cemented)	105/0		. 115/0
Changing Box for 6 pla Daylight Enlarger up to	.tes	36/0		
	ro Slidee 4/7		••••	

A Simple Auto Shutter can be fitted giving T.B. $1\frac{1}{25}$, $1\frac{1}{50}$, and $1\frac{1}{100}$ at 10/- less,

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STUDIO CAMERAS.



Model G.

Mahogany, with lacquered brass fittings. Draw-out Front and Back Baseboard. Rack and Pinion to Front and Back Body.

Long Extension. Ebonized Double Lift Stand. Tilting Eccentric.
Full-sized Focussing Screen and Venetian Shutter Slide.

Repeating Back with Focussing Screen and two 1/1-Plate Slides

Send for fully illustrated list of Studio and Process Cameras.

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic), LTD., 9 and 10, St. Mary-at-Hill, London, E.C.

CROSSED SWORDS

"ALBUMAT"

THE NEW PAPER.

A Successful Substitute for C.C. Matt Papers.

Does Not Crack. Does Not Bronze.

Gives Beautiful Blacks in the Platinum Bath.

The effect is the most Artistic yet obtained on any paper of any make.

Permanent Pictures.

Has Excellent Keeping Qualities.

GRADES.

No. 1. Special White Smooth for Professionals 25/0 per quire.

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	per uire.				per quire.
No. 2. White, Smooth. 3	32/0 N				te 30/0
,, 3. Cream, Smooth	32/0	,,	9. Bank Paper Sur	face, Crear	m 30/0
., 4. White, Fine Grain	32/0	,, I	o1. Half-tone G	rain, Fir	ie
., 5. Cream, Fine Grain ?	32/0		White		. 32/0
,. 6. White, Coarse		,, I	o2 Half - tone G	rain, Fir	e
Grain	32/0		Cream		. 32/0
., 7. Cream, Coarse		,, 1	I. Japanese Pape	r (genuine	e) 36/0
Grain	32/0				

IN BOXES AND PACKETS.

Grades 2 to 11 only.

		12 pcs.			1	2 pcs.
$3\frac{1}{2} \times 2\frac{1}{4}$	 	 6d.	$5^{\frac{3}{4}} \times 4$			
35×28	 	 7d.	$6 \times 4\frac{1}{4}$	 		1/3
$4\frac{1}{4} \times 3\frac{1}{4}$	 	 9d.	$6\frac{1}{6} \times 4^{\frac{3}{4}}$	 		1/6
5 × 4	 	 1/0	$8^{\circ} \times 6^{\circ}$	 		2/4
$5\frac{1}{2} \times 4$	 	 1/1	10 ×8	 		3/10

Sole British Agents: CHAS. ZIMMERMANN & CO. (Photographic), LTD., 9 and 10, St. Mary-at-Hill, London, E.C.

The "Dega" Electroflash.



In order to facilitate the discharge of the "Agfa" Flashlight Powder, the "Dega" Electroflash has been designed to produce the noted brilliant and instantaneous flash of the "Agfa" Flashlight at any given moment at a distance from the operator. A trouble photographers have always had to contend with in flashlight work has been that the attention of the sitter is drawn to the operator when he is firing the powder. This frequently produces an unpleasant expression of expectation that it is desirable to avoid.

In using the "Dega" Electroflash such troubles are overcome. All preparations can be made beforehand; the operator, having the shutter release in one hand, and the "Dega" Electroflash control button in the other, can engage the sitter in conversation, and at the precise moment when the expression is deemed satisfactory an instantaneous photograph (the exposure occupying not more than $\frac{1}{30}$ th sec.) can be taken by pressing first the Shutter-release, and immediately afterwards the Electroflash control button.

In placing the "Dega" Electroflash on the market, it is confidently felt that Professional Photographers will find it an exceedingly useful adjunct to their outfit for night photography, and also the amateur will find it a great acquisition to his photographic outfit, giving as it does great scope in high-class portraiture and other work.

The "Dega" Electroflash is handsomely finished in fumed oak, and brass fittings, and is of English workmanship throughout.

Complete with 100 pieces of Fuse wire, 10/6.

Battery Refills, 1/3.

Stiff Waterproof Carrying Case, Lined, 5/0.

Solid Leather Carrying Case, Lined, with Lock, 10/6.

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ORTHOCHROMATIC

AND

OLOUR PHOTOGRAPHY.

TELEGRAMS- SENTIDO, LONDON. TELEPHONE-8722 CENTRAL. A.B.C. CODE-

1910 PRICE LIST.

Cancelling previous Lists.

Terms-

Prices quoted are at our Factory in London, and are strictly Nett for Cash with order.

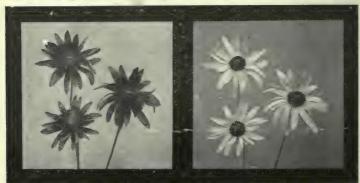
Packing is charged at cost price and is not returnable. Remittances should adequately cover cost of goods, packing and carriage. All goods are packed with the utmost care, and S.S. & Co. cannot hold themselves responsible for damage in transit.

GUARANTEE.—Whilst every endeavour is made to ensure the highest quality of workmanship and material in all our goods, we do not guarantee their efficiency or quality, but any reasonable complaint will always receive prompt attention.

SINGER SIEPHERD& C
- LONDON ~

SANGER-SHEPHERD MEASURED LIGHT FILTERS.

The demand for our light filters from all parts of the world continues to increase, so that another addition to our works became necessary and is now working, enabling us to cope with the greater output.



We originated the manufacture of Measured Light Filters adjusted accurately by actual measurement to the particular plates with which they were to be used, and as far back as 1900 received the medal of the Royal Photographic Society in acknowledgment of this work. After twelve years we are still the only house supplying properly tested yellow screens for any colour sensitive plate upon the market.

OPTICALLY WORKED GLASS.

We take the greatest care to make our filters as perfect as possible in every way, the quality of the glass we use is the best obtainable at the price of the different series. We carry a large stock in several qualities and every thickness, and the quantity we use enables us to buy on the best terms; our methods of testing, cutting, grinding and sealing are the result of many years practical experience. See note page after next.

CRITICALLY TESTED AND COMPOUNDED DYES.

We carry stock of an immense number of dyestuffs which have been under test for their suitability for light filters. Out of these we have selected a number of proved permanence and physical properties which enable us by compounding to reproduce accurately any spectrum curve.

We make many hundred special filters, and in the limited space of this price list it is not possible to include more than a few of the many varieties produced, but on receipt of particulars of what is required we can always supply a suitable filter. See list page after next.

Our new testing and research laboratory is fitted with every instrument, apparatus and appliance we can obtain or devise for the study of light and colour, and its resources are always at the disposal of our clients.

MAXIMUM COLOUR CORRECTION FOR MINIMUM EXPOSURE.

The increasing demand for our filters already referred to, is largely due, we know, to their extremely high efficiency. They give the greatest

possible colour correction, at the least possible sacrifice of exposure, but it is also due to the fact that those who use our filters strongly recommend them to their friends, as we know from remarks often made to us by purchasers, and we take this opportunity of expressing our thanks.

CORRESPONDENCE INVITED.

We welcome correspondence from users of our filters and we are always glad to see specimens of work obtained by their aid; when the subject is suitable for reproduction we are ready to arrange terms for permission to use either the negative or the print.



PERFECTUS X 7 with S.S. Series B plate for photographing oil and Water-colour Paintings, Flowers, China, Microscopy, Enamels, Jewellery, Landscapes with near foreground, Autumn Tints, etc., with every tone correctly translated,

SYLVUS X 3 with Series B plate. To render green and blue luminosities correctly. For Portraiture (avoiding the necessity of retouching), Landscapes, Cloud Studies, Street Scenes, Architecture, etc., etc.

We can adjust both these filters to give precisely the same result with any brand of Orthochromatic Plate, but such adjustment will require longer exposure.

SERIES A Perfectus or Sylvus	Not	exceedin 2 in.	g in diam 2½ in.	
Circle or Square, unmounted	10/-	12/6	18/6	25/-
	12/-	15/-	21/6	28/-
	13/6	16/6	23/-	30/-
	11/6	14/6	21/-	28/-
	12,-	15/-	22/-	29/-
	2/-	2/6	3/6	4/6

SERIES B.- "Best correction for given exposure" Filters.

These Filters are similar to the "A" series, but instead of being adjusted so as to render These riters are similar to the "A series, but instead of being adjusted so as to render all luminosities correctly, they are adjusted to give the best possible correction for a given increase in exposure. We also carry stock adjusted for Barnet, Edwards, Ilford, Imperial, Lumiere, Wellington, Wratten and other makes of orthochromatic plates.

We recommend X3 X5, and X10 as a set which covers most requirements with the usual green-yellow sensitive plate. X3 for telephoto and photography in very poor light; X5 for

general hand-camera work and portraiture; and X10 for landscape and all purposes where

exposure will permit

INCREASE EXP. X2, X3, X4, X5, X8, X10	Not	exceeding 2 in.	in diame	
Circle or Square, unmounted	7/6	8/6	12/6	15/-
	9/6	11/-	15/6	18/-
	11/-	12/6	17/-	20/-
	9/-	10/6	15/-	18/-
	9/6	11/-	16/-	19/-
	2/-	2/6	3/6	4/6

Any Filter supplied in "GRADE EXTRA" glass at Double Price



NO MORE BLANK SKIES. CLOUDS EVERY TIME.

The very latest thing in Light-Filters, and simply invaluable to every landscape photographer, vide the pictures shown at the London Autumn Exhibitions taken with its aid, and the hundreds of testimonials still

Graduated Filter

arriving from satisfied users in all parts of the world, several of whom assure us it is the accessory to their camera which they prize above all others, From the many purchasers of the filter, no other than appreciative comment has ever reached us.

CAN BE RAISED OR LOWERED ON THE LENS.

It is made in oblong form and has the colour graduated from full tint at the top to clear glass at the bottom. If pushed up to its highest position so that the clear glass covers the foreground it ortho-

chromatically corrects so as to give the clouds and distance in the picture **WITHOUT INCREASE IN EXPOSURE.** When pushed down to its lowest position in the fitting it renders everything with its maximum colour value, in a minimum of time. Intermediately it can be used as a X2, X4, X6, etc.

1	ESSENTIAL FOR SWISS VIEWS.	Width	ıs in.	2 in.	2½ in.	34 in.
-	Graduated, unmounted Graduated, mounted in A fitting for shutter Graduated, mounted in B fitting for lens Morrocco leather, span case, velyet lined		10/- 11/6 12/- 3/-	12/6 14/6 15/- 3/6	18/6 21/- 22/- 4/6	25 - 28 - 29 - 5 6
1	Morocco leather snap case, velvet lined	4.4	3/-	3/6	4	6

HOW TO ORDER FILTERS, FITTINGS AND CASES. ORDERS TO AVOID DELAY SHOULD STATE:-

- 1. Brand of Plates to be used, and for what purpose.
- 2. Name of Filter and size of circle or square,
- 3. Whether to be sent in Snap Leather Case.
- 4. Which of the 4 fittings and whether lined :

CLOTH LININGS 6d. extra.	18-in.	2-in.	2½-in.	31-in
Spring Cap. Slips on to lens tube	2/-	2/6	3/-	3/- 5/- 3/-
Screw Cell. Screws into lens	3/6	4/-	4/6	
Pattern A. For T.P. Shutter.	1/6	2/-	2/6	
Pattern B. Slips on to lens tube	2/-	2/6	3/6	



5. Exact size of lens as follows:

FOR BLACK BRONZED CELLS (Spring Caps) a strip of hard writing paper may be cut to exactly meet round the part of the lens on which the filter is to fit, but it is always best to send the lens whenever possible.

FOR CELLS TO SCREW into one of the combinations we must have the lens for fitting. All fittings are made in our own factory, and when necessary the lens can be returned the same day as received.

6. If "Grade-extra" Glass is to be sent.

The glass used in all our standard filters is ground and polished on both sides (known in the trade as "optical flat") and is carefully selected and good enough for all ordinary purposes, but for tele-photography and the highest class of long-focus lenses of a very large aperture, we carry a stock of extra thick flats; the thickness of the sealed filters varies from \(\) to \(\) inch depending upon the size of the filter. This glass is designated \(\text{GRADE-EXTRA}, \) and the cost doubles the price of the filter.

PHOTO-MICROGRAPHIC & SPECIAL FILTERS.

Sharp cut monochromatic micro-filters with chart stating curve of absorption of each.

Deep Red Orange Yellow-green Blue-green Blue-violet Violet

1%-in. Sq. 5/- each, Set of 10 in case, 50/-, 2-in. Sq. each, 7/6, Set in case 75/
Pillar Stand Heavy brass base, sliding arm and holder to take 1 5/8 or a 2-in. filter 15/Cameras for Photo-micrography in several patterns from £4 to £60.

Special Filters.—High luminosity blue and high luminosity green filters for visual work. Thallium line green screen, as used in the last Eclipse expedition. Compound Aesculin yellow filter for tele-photo work. Special ultra-violet 1902, Aesculin filter. Special ultra-violet filter 1903, Aesculin compound filter. Special ultra-violet filter 1903, special compound filter. Special ultra-violet ight. Special military field-use filter for observing discharge of smokeless powder as used during the Boer War. Filters for use in studying the explosion of gases of internal combustion motors. Smoke recording test sets. Skin colour chart sets.

SANGER-SHEPHERD TRICHROMATIC FILTERS.

PRICE PER SET OF THREE.	15-in.	2-in.	2½-in.	3½-in.
Grade-extra glass, square or circular g(quality, square or circular c ,, ,, ,, ,,	50/-	63/-	80/-	105/-
	20/-	25/-	35/-	50/-
	15/-	20/-	30/-	40/-

SANGER-SHEPHERD COLOUR PLATES.

The most perfect Colour Plate on the market. Coated on the finest selected glass, they are suitable for both Orthochromatic and Colour Photography; we specially recommend backed plates for all classes of

work. The backing is dead black, will not chip off or cause dust, and need not be removed before development, but washes off readily after fixing. Sensitive to the whole of the visible spectrum, they must consequently be put into the slides in total darkness. To facilitate this the plates are packed in pairs face to face, and these pairs separately wrapped in paper, thus observed.



ately wrapped in paper, thus obviating any doubt as to which is the film side. The Daylight Speed without a filter is approximately Wynne 95,

Watkins 220, H. & D. 150

We stock all sizes of light filters for this series of Colour Plates.

Price. $6\frac{1}{2}/2\frac{3}{8}$ $8/3\frac{1}{3}$ $9\frac{3}{4}/4\frac{1}{4}$ 1/4 5/4 1/2 1/1 10/8 12/10Per dozen, unbacked 2/4 4/3 6/- 2/- 3/- 4/3 8/- 12/- 19/-

SANGER-SHEPHERD UNIVERSAL DEVELOPER.



The complete developer is packed in two tubes and the contents may be easily removed; all the constituents of each tube are in fine powder, and dissolve almost instantly in water. There are no complicated formulæ to worry about, no weighing or measuring is necessary, and as the chemicals used are carefully tested, both in bulk and in every batch put up, pure, fresh and energetic solutions are always obtainable.

20-cz. tubes No. 1 (Neg.) Developer, 1/4, doz. 15/6 6-oz. ditto (for use when travelling), 6d., doz. 5/6 20-oz. tubes of 2 and 3 (Positive), 9d., doz. 8/6 Box of No. 1, 2 and 3 (making 40-oz.) each 2/1 Box of 3 tubes, No. 1 only (in all 60-oz.) each 2/0-oz. stoppered bottle of No. 1, in solution,

DEVELOPING DISHES FOR TRIPLE PLATES.

concentrated and made up ready for use



Made of well seasoned celluloided wood, fitted with corrugated glass base. Economise developer and ensure complete covering in dark if previously levelled. The corrugated glass base prevents any sucking of the plate to the bottom, and the German silver lever supplied with each allows of the rapid removal of the negative

without touching the developer with the fingers.

Price for 8 x 3½ and 9¾ x 4½, 4/- (larger sizes also stocked).

DARK ROOM TREATMENT OF COLOUR PLATES,

New Model Developing Dish Case and Cover.



With the highly sensitive plates of the present day it is very essential that the plate should be kept covered during at least the greater part of the time occupied in development.

The new model consists of a really well-made tray, enamelled inside and out; this tray carries the ordinary developing dish. The outer cover, of

the same material enamelled black inside and out, is furnished with a fold-down handle. The cover, fitting quite loosely is easily put on in the dark room, yet the plate is perfectly protected, and bench kept clean from solution; used by many of our clients for developing when travelling. 93 x 41 1 and 5/4 8 x 33 and 1/1

4/6 6/-

Time Clock and Bell for Developing in Dark, Price 8/6

SANGER-SHEPHERD TESTED SAFELIGHT CLASSES.

AUTO. For Red Sensitive and Autochrome Plates | SPECTRUM RUBY For Green Yellow Sensitive Plates | used, and we will C.F.O. Most comfortable Green Light for ordinary Plates. Does not tire the eyes.

ORANGE. For Lantern Slide and Bromide Emulsions 10 x 8 stocked 5/6.

State Ortho plate send corre t safelight. Cut any size.

DARK-ROOM SAFE-LIGHT LANTERNS. Planned to give ample ventilation without light leakage, and correct adjustment of the strength of the

Well hot-japanned inside and out with Russian iron chimneys and Bromide exposing caps at side, and fitted to hang on wall or stand on bench.

illuminant to the area.

FOR ELECTRIC LIGHT. fitted with cord, switch and plug and one safelight and

single ruby glass, with device for tilting to any angle, FOR OIL or Carriage Candle, with exposing hole and outside

FOR CAS with exposing hole, outside regulator and I safelight

Best quality only.

regulator, and one safelight and single ruby glass. 17 6



Sanger-Shepherd Slides re-produce the brilliance of the colour photographed. without grain, loss of light, or admixture of black, and are characterised by accuracy of colour-rendering impossible by any other method.

OUTLINE OF THE SANGER-SHEPHERD PROCESS.

The Standard Sanger-Shepherd Colour Plate. 8 x 31 ins., is exposed in a quick change repeater, fitted to take the place of the dark slide in any camera, at a total average outdoor exposure of about three seconds, or alternatively in a One Exposure Camera. The plate when developed in the ordinary way is of the appearance shewn in the figure. From each neutral negative a coloured positive is made:-

From the red filter neg.

From the green filter neg.

From the violet filter neg.



a blue toned slide.

a pink stained relief.

a vellow stained relief.

The pink and vellow reliefs are printed together at one operation on sensitised coated celluloid, developed in warm water, and dyed so that when placed over the blue glass slide and bound together they accurately reproduce every colour of the original.

(Full detailed Working Instructions are supplied free with every Outfit.)

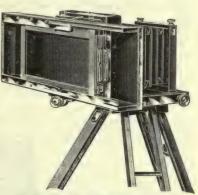
TRIAL OUTFIT: - Accurately measured Colour Filters of large size such as are required in our repeating backs are, like lenses, expensive to produce, but fortunately, small filters 15 in. square are large enough to intercept all the light passing through most quarter plate lenses. A set of these and a fitting (as Fig.) to be placed on the lens of purchaser's own camera, together with all actual necessaries for making lantern slides, and complete working instructions is offered as trial outfit at 25/-



SANGER-SHEPHERD 8 × 31 REPEATING-BACK. STANDARD LANTERN SIZE WITH QUICK-CHANGE.

This may be attached to any 1, 1 or whole plate camera or plate Kodak by means of a panel cut to correspond and interchangeable with ordinary dark slide. This does not in any way interfere with the use of the camera for The three ordinary work. Colour Filters are held in a frame, clipped in front of the Double Dark-Slide and are moved with the plate. special device it is impossible to expose through the Filters except in the correct order.

Two turns of the knob, and three snaps of the shutter give us a permanent record of every colour as seen on the focusing glass.



The Repeating-Back taking the place of the Dark-Slide on an ordinary Camera.

For the purposes of fitting the Repeating-Back, purchaser's Camera should be sent us, or its Reversing-Back, for a day. A small charge, not exceeding 7/6 is made for this fitting.

PRICE—Lantern Slide Repeating Back for attrchment to any focussing camera, fitted with a set of Sanger-Shepherd New Rapid Series measured Colour Filters for use with the Sanger-Shepherd Colour Plates, focussing glase, and one double dark-slide, with best ebonite draw-out shutters, taking plates 8 by 3\frac{1}{3} inches, large enough for full-size lantern-slides,



after allowing for the space taken out of 3½ inches square by the binding strips, with Milled Knob and Quick-change Rack £5 5 0 Extra Double Dark Slide 0 10 6 Solid Leather Carrying Case, Velvet Lined, with Lock and Partition for Slide 1 5 0

To order we can cover the outer case in black leather, and finish the Dark Slide, Focussing Glass and Panel in dead black at an additional cost of 10/- to match the many leatner covered cameras on the market.

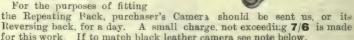
SANGER-SHEPHERD TRIPLE-QUARTER (9\(\frac{3}{4} \times 4\(\frac{1}{4} \)) NEW QUICK-CHANGE REPEATING-BACK.

Highest Efficiency and very best quality throughout. For Landscape, Portraiture, Lantern Slide and general purposes.

We confidently recommend this as the best all-round attachment manufactured, for 5/4, 1/2, 1/1, or Studio Cameras (for portraiture). For lantern slides it is not necessary to work up to the extreme edge of the Negative, as in the $8 \times 3\frac{1}{3}$ size, and the best part of the picture may be relected. It is possible to make daylight enlarged sets of negatives up to 12×10 .

The Quick-Change Rack now fitted to this Standard model, lessens the time of the total exposure, which now rarely need exceed 3 seconds

for landscapes, or 6 to 20 seconds for Studio Portraiture. It is convenient and easy to move, and obviates risk of accidental shifting of the camera. By a special device, it is impossible to expose through the Filters except in the correct order, viz.:—Red, Green, Blue,



PRICE—Triple-quarter, best quality, Repeating-Back for attachment to purchaser's camera, fitted with Sanger-Shepherd New Rapid Series Measure! Colour Filters for use with Sanger-Shepherd Colour Plates, focussing glass, best polished mahogany double book-form dark-slide taking plate 9\frac{3}{2} x 4\frac{1}{4}. German silver springs, including new quick-change ruck and ebony handle

Best polished mahogany book-form double dark slide $9\frac{3}{4} \times 4\frac{1}{4}$, for each one supplied extra ... 11

Solid Leather Carrying Case, velvet lined, with lock and



partition for extra slide ... 1 10 0

To order we can cover the Repeater in black leather, and finish the Dark Slide, Focussing Glass and Panel in dead black at an additional cost of 10/-.

Large Repeating Backs supplied for Plates up to 12 x 10.

SANCER-SHEPHERD ONE-EXPOSURE CAMERA.

(Patents applied for).



QUITE THE SIMPLEST WAY FOR AMATEURS TO PHOTOGRAPH IN NATURAL COLOURS WHICH FOR PURITY ARE ONLY EQUALLED BY THOSE UPON THE FOCUSSING-GLASS.

EASE OF EXPOSURE.

The camera is placed on the tripod, and the view focussed. The dark slide is then inserted, and exposure completed by uncapping the lens for a few seconds (by bulb if preferred). A meter supplied with the camera tells the exact time required.

FACILITIES FOR "THE REST."

To those whose time is fully occupied and who yet wish for an easy means of recording in colour the interests of scenes abroad, this camera will come as a great boon. The plates supplied with it keep well, and the immediate attention demanded by other methods is not required here.

If the exposed plates are posted to us we will develope them and supply the finished slides. Our special department for this purpose has such work constantly in progress, and the extremely beautiful results obtained can be seen at our Showrooms at any time. Any number of copies can be made. Those who prefer to finish their own positives can do so at their leisure and will find details of their requirements over-leaf.

ONE LENS, ONE PLATE. ONE EXPOSURE.

The three negatives are taken upon one plate, by one lens, at one exposure. The camera is very compact and portable, whilst the arrangement for the dividing of the image from one lens into three parts is particularly free from liability to derangement, and we can confidently recommend the new model for use both at home and abroad.

These cameras open quite a new field for colour photography, as they enable excellent pictures to be obtained even when movement occurs during the exposures, for, as the move-

ment occurs equally in all three negatives, all irritating colour fringes are avoided.

NO COMPENSATING SCREEN REQUIRED.

The adjustment for varying sensitiveness of different batches of plates is accomplished by a novel form of diaphragm, so that the setting of the camera to ratio is merely a question of setting the diaphragm—no compensating screen being necessary.

PRICES. TWO MODELS NOW READY:-

Model 1 —The smaller size takes three negatives $2\frac{3}{6} \times 2$ -in. on a single plate $6\frac{1}{2} \times 2\frac{3}{6}$ -in. making a contact print sufficiently large for lantern projection. The dark slides in this model are beautifully made in mahogany of the book pattern. The body is covered in Black Persian morocco; fittings in black bronzed brass. **Price £25**.

Model 2.—Takes a plate 8 x 3 x/3-in., the same as our repeating back of this size; the dark slides are the same pattern and interchangeable with those in the repeating back. Best London finish, Price £440. Extra slides and solid leather velvet-lined cases stocked.

DEVELOPING AND PRINTING MATERIALS, FOR SANGER-SHEPHERD COLOUR PHOTOGRAPHY.

COMPLETE DEVELOPING AND PRINTING OUTFIT FOR LANTERN SLIDE MAKING, FROM EITHER SIZE OF TRIPLE NEGATIVE OBTAINED WITH REPEATING BACK OR ONE EXPOSURE CAMERA, INCLUDING ALL NECESSARY REQUISITES FROM THE LIST BELOW £4 4 0;

Materials for making Three Colour Exposures, etc.

Tripod Stands, best ash, locking, \$\frac{1}{2}\$ pl. 16/6, \$\frac{3}{2}\$ pl. 17-/, Tripod Screw 1/Focussing Glass, with adjustable mount and screw collar, \$5/Focussing Cloth, black twill and ruby, 1/9, best velvet old gold \$5/6\$, waterproof 2/3
Juminium Everset Shutter, to fit lens diam. 35 mm 15/-, 40 16/-; 45 17/-; 50 18/-; 60 20/Wynnes Infallible Exposure Meter and refill 6/6 Refill -/6
Photographic Chronometer stop watch, invaluable for timing exposures, development, &c., 25/Sanger-Shepherd Exposure Cards for Colour Photography, in packets, 1/Concentric Circles for Lens Testing Charts, in packets, -/6
Complete Working Instructions for Sanger-Shepherd Process if supplied separately 2/-

Materials for making Three-Colour Negatives.

Plates, Developer, Dishes, Covers, Clock and Safelights (see p.p. 1040 and 1041). Tin Casing of Dry Plates to preserve against climatic conditions, $\frac{1}{4}$ -pl. -|8, 5|4 $-|9, \frac{1}{4}$ -|10, 11|, $8 \times 3 \times 1/3 = |9, 9\frac{1}{4} \times 4\frac{1}{4}$ [Graduated Measures cc. and 0z. 2-0z. -|6, 6-0z. -|9, 10-0z. 1, 20-0z. 1, 4, 40-0z. 2|6] Johnsons Crush Meter should be in every dark room, 4-0z. 2|-, 10-0z. 3|- Cloth covered Negative Boxes $\frac{1}{4}$ and $\frac{1}{4}$ $-|5, \frac{1}{4}|$ -|6, 11| $-|8, 8 \times 3 \times 3|$ $-|8, 9\frac{1}{4} \times 4\frac{1}{4}$ 1/- Celluloid Enamel for Varnishing Negatives 1, 1, 1/9 and 3/6 Specimen three-colour Negatives showing density and style for perfect results 10/6

Materials for making Blue, Pink and Yellow Positives.

Black Tone Plates for Blue Positive 3½ sq. 1/-, ½ 1/-, ½ 2/3, x/x 4/3

Minus Red Converting Solution for Blue Positive 1/- and 1/6

Celluloid Enamel for Blue Positive 1/-, 1/9 and 3/6

Coated Films 6½ x 3½ for Pink and Yellow per doz. 4/3, ½ 2/10, 5/4 3/3, ½ 5/10, x/x 9/
Special Sensitizer for films -/6 and -/9

Dark Room Film Pins, per doz. -/6

Calcium Storage Case for sensitized films for sizes up to ½ plate 3/6, triple ½ and x/x 6/
Calcium Film Drying Box for use where dry dark room not available 12/6

Triple Hinged Printing Frame and glass for either size 7/6 Actinometer (p. x053) 5/
Enamelled Vessel and lid, boards, &c. for developing films 7/6. Thermometer 1/6 and 5/
Pair of Semi Porcelain Stain Dishes and glass covers ½ pl. 1/6, 5/4 1/8, ½ 2/2, x/x 2/6

Pink Staining Solutio1 (minus Green) 1/9 and 3/6, Vellow ditto (minus Blue) 1/9 and 3/6

Forceps, plated, keep dye from fingers 1/6 Filter Bags for dyes -/6 Glass Funnel -/6

Varnished Wooden Tray and Lid for keeping stains clean and in readiness for immediate use 5/6

Example Set of Blue, Pink and Yellow, stained and registered 7/6

Example piece of Property Developed Film 1/-, ditto fixed 1/-

Materials for sealing and completing Slides.

Pure Copper Sulphate for fixing films -/6 Crystal Varnish for films 1/3 and 2/6 Steel Clips for registering films on Blue Positive, per doz. 1/Special Canada Balsam for sealing slide 1/6 and 2/6 Special wood Sealing Clips each -/9
Brass Stand and Beaker for warming Balsam 2/6, Spirit Lamp, or Gas heater 2/Thin Cover Glasses 3½ sq. per doz. -/9, ½-pl. 1/-, ½-pl. 2/-, x/x-pl. 3/Special Double Gummed Binders 1/4
Sealed Slides from stock each 10/6 Stereoscopic Slides from stock 15/Black Table Viewing Frames ½-pl. 5/6, ½-pl. 7/6, whole plate, 10/6
Polished Mahogany zhibition Frames 8 slides, 10/6, 15 slides, 15/Ditto, Opal Glass Reflector, Brass Hinged Strut 20/-

PRINTS IN COLOUR UPON PAPER. SANCER-SHEPHERD PATENT IMBIBITION PROCESS.

Outline of the Sanger-Shepherd and Bartlett Patent Process

From the triple-negative obtained with Repeating Back or One-Exposure Camera as described previously, three transparent carbon reliefs are made in a similar manner to the pair used for

lantern slides but upon celluloid specially coated to give a very low relief.

These three hard bichromated reliefs, termed Flexible Printing Plates, are cut apart and

dyed Blue, Pink and Yellow respectively and whilst wet are squeegeed successively for a few minutes each, on to the coated paper supplied which has been previously damped. The latter absorbs the dye sharply from each printing plate. Care must be taken to superimpose the images. After the third relief has been applied and removed the colour photograph consists of nothing but the colouring matter locked up in the single film of gelatine on the paper base. The Flexible Plates may be re-dyed and used repeatedly.

PRICES .- Additional materials required to those already supplied for lantern slides including limited licence to work the patent process are :- 1 plate 20/-; 1/1 plate 40/-.

For Fuller Details see Booklet post free on application.

Patent Water Colour Printing Inks, Blue, Pink and Yellow, each 1/9 and 3/6. Patent Flexible Printing Plates, per dozen \$\frac{1}{2} 3/-; \frac{1}{2} 6/-; \frac{1}{2} 10/6; \frac{8}{2} \times \frac{3}{4} 3/5 \frac{3}{4} \frac{4}{2} \frac{9}{6}. Patent Gelatine Coated Paper, per dozen \$\frac{1}{4} 1/-; \frac{1}{2} 2/-; \frac{1}{2} 1/2 \frac{3}{2} 9; Printing Plate Sensitizer 6d.

SANGER-SHEPHERD ONE-EXPOSURE STRIPPING FILMS FOR PAPER.

These films are similar to our regular Lantern Slide Transparency Film, but on a celluloid base, prepared for stripping-prints are made from the three negatives, and as the temporary pigment (bromide of silver) is the same in all the prints, they can be exposed and developed together. The prints are fixed and stained up in the colour bath, and after drying transferred to the mounting paper, and stripped in superimposition. The gelatine film is alike for all three negatives and the correct scale of gradation is preserved, a desideratum impossible with separate films containing different coloured pigments.

In packets of one dozen, together with four sheets of mounting paper. 1 2/3; 1 4/9; 1/1 8/9; Concentrated Stain Baths, per set of three, small 5/3; large 8/6.

SANCER-SHEPHERD THREE COLOUR PICMENT PAPER.

The Tissues are put up in packets containing four sheets of each of the colours, cyan blue, pink and yellow, and four sheets of final support. 1 9d.; 1/6; 1/1 2/9; 10/8 3/8.



Steroscopic slides in Natural Colours are so extremely beautiful, and have such a lasting fascination for many of our ablest clients that it is surprising that they are not more generally attempted. Even a portrait is not difficult to get, and when completed comes as near to the absolute acme of realistic life, as any inanimate impression can do. There is no irritating grain, by the S.S. method, which is unavoidable with stereograms taken upon screen plates.

COLOUR.

ONE-PLATE STEREO-REPEATERS.

Myrioscope Repeater with filters £12 10s. 62 x 31 Repeater with filters £17 10s.

Ditto in detachable box camera as fig.

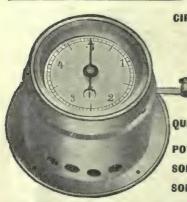
for client's own lenses £20 0s.

Quick-change device can be fitted to all models.

AUTOCHROME COLOUR PHOTOGRAPHY.

THE STARCH-CRAIN SCREEN-PLATE METHOD.

Plates. Box of 4. 3\frac{1}{3} \times 3\frac{1}{3} \div 3\frac{1}{3} \div 2/6 3\frac{1}{3} \times 4\frac{1}{3} \div 3/0	Autochrome Screens.	Screen Holders.
5 x 4 4/6 6½ x 4¾ 7/6 8½ x 6½ 14/0 Myrioscope 2/8	118 sq. 3/0 118 ,, 4/0 214 ,, 5/0 318 ,, 7/6	1 sq 3/0 1 1 1 1 3/6 2 1 1 4/6



CIRCULAR AUTOCHROME SCREENS cut and fitted in spring caps or screw cell.

to fit any size or make of lens or camera, A strip of hard writing paper may be cut to exactly meet round the part of the lens on which the filter is to fit, but it is always best to send the

lens whenever possible. For Cells to Screw we must have the lens for fitting.



QUINOMET (for 1st and 2nd Development), 35-0z. 4/6, 17-0z. 2/6, 9-0z. 1/6, 41-0z. 1/0

POT. PERMAN. (for Reversal) for 35-oz. 6d.

SOD. SULPHITE (Anhyd. S.S.) 1 lb. 1/9

SOD. CARB. (Anhyd. S.S.) 3-lb. -/9

DARK-ROOM TIME CLOCK recommended for developing Aufochrome and Colour Place in total darkness, bold figures, rings bell at 2½ and 5 minutes (see fig.) each 8/6 Varnish for Autochromes 6d, 1/-, 1/9, 3/6. Sanger Shepherd Auto Safelight 10 x 8 5/6. Autochrome Intensifier 2 solution 1/6.

Air, Light and Water-tight Case in best jap. metal, for preserving plates, when travelling 25/-

Cover Glasses per doz. 3½ x 3½ -/9. ½ 1/-, 5/4 1/6, ½ 2/-, x/x 3/-.

Binders, Double Gummed, very strong, per box, 1/4.

Viewing Frames, cloth covered folding for pocket, with mirror, ½-plate 6/-, 5/4 6/6, ½ 7.

THE SANGER-SHEPHERD X-RAY PLATE.

These Plates are specially prepared in order to obtain the greatest possible sensitiveness and detail by exposure to X Rays, enabling photographs with fine detail to be obtained by short exposure. They will be found particularly valuable in photographing the thickest parts of the body. They are very slow to daylight and are unsuitable for ordinary photography.

PRICE per doz. 6\frac{1}{2} x 4\frac{3}{4} 4/6, 8\frac{1}{2} x 6\frac{1}{2} 7/6, 10 x 8 12/6, 12 x 10 17/6, 15 x 12 30/-

ADVANTAGES CLAIMED - Great sensitiveness to the X Rays. Much increased detail of structures. A single thin film of emulsion. Quickly developed and fixed. No trouble from frilling of the film. In use in all principal Hospitals.



SANGER-SHEPHERD PHOTO-SURVEY CAMERA.

Our cameras for Photographic Surveying are designed to map the detail of a triangulated area in a tenth to a third the time taken by plane tabling, and the results compare favourably in accuracy. We have several models with various accessories designed to suit the special requirements of travellers and exploring parties in addition to our standard models as supplied to the order of the Canadian and other Government Survey Depa tments. Booklet with prices on application and particulars of complete outfits, from £10 to £120.

The accompanying figure is from a photograph of a New Model Photo-Theodolite for Cap ain F. Vivian Thompson's method of Stereo Surveying, made by Sanger-Shepherd & Co., Ltd.

BALLOON AND KITE CAMERAS. **ALSO CAMERAS WITH & WITHOUT** ELECTRIC LIGHT FOR DEEP SEA. SALVAGE AND WRECKAGE WORK.

PHOTO-EQUIPMENTS FOR EXPLORING PARTIES.

COMPLETE PHOTOGRAPHIC EQUIPMENTS FOR EXPLORING AND SURVEYING PARTIES supplied from stock at short notice. Cases and packing designed for mule or bearer-portage.

Lenses, Cameras, and other Goods advertised by any Manufacturer or Dealer may be obtained through us at List Prices. We test all Appliances before forwarding to ensure their being quite up to Specifications. Indents from Clients abroad always receive special attention,

APPARATUS MADE BY US TO SPECIAL DESIGN

Our Factory is equipped with the latest and best wood and metal working machines, many of which have been designed by ourselves to suit the special work for which they are intended. We are therefore in a unique position to produce models of new inventions, cameras or other photographic, optical, electrical or physical apparatus to special designs, either for single instruments or in quantity.

GRAY'S INN PASSAGE IS THE SECOND TURNING ON THE RIGHT IN RED LION STREET. WHEN COMING FROM HOLBORN.

Amongst other special apparatus manufactured by us last year, were complete stations for Dr. Korn's method of sending

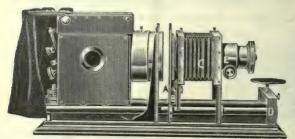
PHOTOGRAPHS OVER THE ORDINARY TELEPHONE WIRES. two complete stations equipped for the Korn Telegutograph, and five sets for the

THORNE-BAKER ELECTROLITIC PHOTO-TELECTROGRAPH.

to the order of The Daily Mirror.

5, 6 & 7. GRAY'S INN PASSAGE, LONDON, W.C.

SANGER-SHEPHERD IMPROVED OPTICAL LANTERN



A perfect instrument for the Projection of Lantern Slides and 1-plate Transparencies. Projection Microscopic and Polariscopic Slides and the Spectrum. larging 1-plates or Lantern Slides and General Science Work.

Lantern complete with 6 inch condenser and Sanger-Shepherd Arc Lamp

Strong Pine case, fitted for accessories, extra

An excellent Model with Sanger-Shepherd Arc Lamp supplied at ...

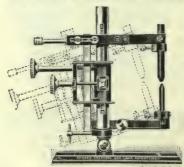
10 0

An excellent Model with Sanger-Shepherd Arc Lamp supplied at ...

11 0 0

This Lantern and S.S. Arc Lamp may be seen working at our Showrooms any time, where clients' Slides and Autochromes will be projected free.

SANCER-SHEPHERD PATENT HAND-FEED ARC LAMP



A perfect hand-feed Arc Lamp built on an entirely new model for Projection Work, Photo-Micrography, Illumination of Paintings Spectroscopy. General Laboratory Work. No. 1 for currents to 15 amps. 25 5 0

Special Features

Extreme range of adjustments. The simplicity of manipulation. Extreme Steadiness and Rigidity. Working equally well with Direct or Alternating Currents.

Carbons for continuous currents, per doz. pairs (5 to 9 amps) 2/0 10 to 15 amps 3/0

,, for alternating currents ,, 5 to 9 ., 2/6 ,, 3/6

Flexible cord, cotton covered, to 15 amps., per yard 7d.

Voltmeter, to show voltage 11 to 240 volts 50/
Ampere Meter up to 20 amps. 45:-

Estimates will be submitted free for Electric installations for enlarging, or Arc Lights for Photo-Printing or Projection. Our experience of such work is very considerable and our expert will attend to advise on the best method to employ.

FIXED RESISTANCE.



Resistance wound on porcelain bar mounted on cast iron base, with ventilated cover. 100/110 volts, £1 5s Od. 200/250 volts, £2 10s. Od.

NEW MODEL SIX STOP ADJUSTABLE RHEOSTAT FOR USE WITH S.S. ARC LAMP.

Soundly constructed resistance for open type lamps, fitted with insulated handle and six regulating stops to raise or lower amperage

six regulating stops to raise or lower amperage at arc, thus adjusting the strength of illuminant to suit:—

- z Distance from Screen.
- 2 Difference in Slide Density.
- 3 Increase for Autochromes,
- 4 Negative Enlargements.

Resistance complete on wrought bar frame with thick slate insulation and enamelled slate 6 stop switch. Range 5 to 10 amps., high or low voltage. Other Ranges to order. £3 10s.

Operator. Lantern, Sheet and Slides provided at short notice for Lectures

PHOTOGRAPHIC PRINTING ARC LAMP

Automatic. Enclosed type. For Printing Portraiture and Process Work. Highest Efficiency. Thoroughly Recommended.

Either 6 to 8 or 10 to 12 amps., to burn singly on 100 to 250 volts, continuous or alternating, £4 10 0

(Resistances are required for continuous current and choking coils for alternating current circuits. Adjustable pattern resistance recommended for best results.)

able pattern res	sistance r	ecom	mended j	or be	st re	esults	.)
Fixed Resistance	enclosed	type	100-120 /	olts 4	03	17	6
22 . 22	9.7	2.9	200-240	2.7	1	5	0
Adjustable ,,	9.9	9.9	100-120	2.7	2	2	6
, ,,	9.9	3.7	200-240	22	2	10	0
Choking coil for	100-120 V	olts	***	***	1	10	0
	200-240		***		2	10	0
D.P. quick-brea	k switch	and	fuses	***	1	0	0
Reflector, side p	attern fo	r poi	rtraiture	see			
Fig.) or con					0	10	6
Best photograpi							_
3d., 50 feet				***	0	10	0
Tripod stand, 8 i							
halance-weig							

hook, metal tube, finished black .. 2 10 0

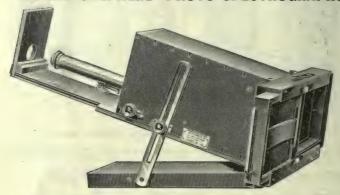


SANGER-SHEPHERD POCKET SPECTROSCOPES.

THREE-PRISM DIRECT-VISION SPECTROSCOPE FOR EXAMINATION OF SCREENS, LIGHT FILTERS AND DARK ROOM SAFELIGHTS

Ditto in well made snap case, velvet lined 25/-Ditto best make, adjustable slit and achromatic lens 30 -Larger instrument, 55/- or with Comparison Prism and Photographic Millimetre Scale for determining the position of the lines 85/-

SANGER-SHEPHERD PHOTO-SPECTROGRAPHS.



BEST PHOTO-SPECTROSCOPIC CAMERA MODEL NO. I.

First class three prism direct vision spectroscope, fitted with adjustable slit and focussing head, complete in itself and very useful as a laboratory hand spectroscope for visual work.

The Spectroscope is attached to the camera by screwing into the flange in the front panel. The body is adjustable by slotted arm to elevation of the Sun. Carrier and stage for filters, shutters, &c. Focussing screen and dark slide for $4\frac{1}{8} \times 3\frac{1}{8}$ plates in repeating back for 4 exposures $2\frac{1}{8} \times 3\frac{1}{8}$ visible spectrum on $3\frac{1}{8}$ -in. (contact lantern slide.) Repeating back can be raised for Ultra Violet. Best Finish, 150/-; Comparison Prism, 15/-. For Laboratory Arc Lamp, see previous page.

COLLEGE LABORATORY MODEL NO. 2. An invaluable instrument, beautifully made and always ready for use, and thoroughly recommended with the Spectroscope enclosed in the Camera Box.

Specification.—Outer case polished mahogany, $10\frac{1}{2} \times 3\frac{1}{2} \times 5\frac{1}{2}$ inches deep; detachable repeating back, $9 \times 5 \times 1\frac{1}{2}$ inches, with German silver latch, and single dark slide to take four spectra upon a quarter plate. The Spectroscope is mounted on a panel sliding into the outer case, readily detachable for visual work. Condenser on sliding base. Stage and spring clips for holding test object, light filters, &c. The length of the Spectrum from A to K is suitable for direct contract printing of Lantern Slides As this excellent instrument is made in quantity we are able to supply at the exceedingly low price of 70/-.

CONCAVE DIFFRACTION - GRATING SPECTROGRAPH MODEL NO. 3. Polished mahogany outer case, fitted with rack and pinion repeating back for taking 6 spectra on a quarter plate and with dark slide arranged with 2 matts:—One for flat plates and the other curved for use with celluloid films. Diffraction grating cast mounted on concave glass and silvered. Adjustable slit, with 100 thread drum screw reading to one thousandth of an inch. Price Complete, 150/-

THE CHAPMAN-JONES PATENT PLATE TESTER.

Sanger-Shepherd & Co., Ltd., Sole Makers.



Illustrated
Descriptive
Booklet free
on application.



1 10 11 20 21 atb ntb1
2 9 12 19 22 TUDW atb7
3 8 13 18 23 SALE CONTACT
4 7 14 17 24 CCAPPER ACS
5 6 15 16 25 SAME SAME SAME

A Simple instrument for testing photographic plates and films. Examination of plate shows:—

- 1. Sensitiveness or Speed;
- 2. Range of Gradation:
- 3. Range of Exposure;
- 4. Colour Sensitiveness:
- 5. Grain: 6. Halation:
- 7. Most suitable Dark room Light, &c.

PRICE.—Instrument complete, comprising 4½ x 3½ Screen Plate, as above, special dark slide, exposure board, folding candle shade, adjustable candle holder and standard candle in neat case with book of working instructions, 37/6 Inland postage, 1/- Special dark slide and screen plate only 28/6. Inland Postage, 6d. Screen Plate only, in case with instructions, 21/- Inland Postage, 3d. Tested Candle, 1/-

GRADUATED COLOUR SENSITOMETER.

A new and convenient Instrument for ascertaining the relative red, green and blue sensitiveness of colour sensitive plates. This little instrument consists of a graduated plate, 4½ by 3½-in. covered by three strips of coloured filtering medium, each provided with a numbered graduated scale. By simply exposing the plate to be tested to daylight behind this screen and developing, the relative sensitiveness to red, green and blue light can be seen at once.

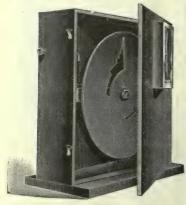
Price complete, 21/-

FRACTION TINT ACTINOMETER.

For accurately timing all Carbon Printing, including the making of Reliefs for Colour Photography, fits \(\frac{1}{4}\)-pl. printing frame 5/0



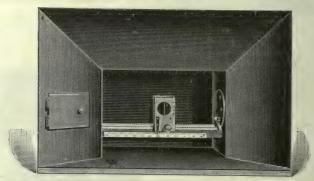
H. & D. DENSITY MEASURING APPLIANCES.



Strictly in accordance with Messrs Hurter & Driffield's Specifications.

Note.—The H. and D. System is absolutely and mathematically sound and accurate, if instructions are carefully followed, but unfortunately nearly every plate maker ignores some portion of the inventor's systems, either the illuminant, developer or photometer, and for this reason the numbers marked on the plate boxes vary considerably, even when a genuine attempt at measurement is made. To the careful worker, therefore, this apparatus is essential.

Descriptive Booklet on the H. and D. System, 7d, free.



EXPOSING MACHINE for imprinting a series of exposures upon a plate. Mahogany case with exposing shutter, and special single dark slide on hinged door at back. Engine divided sector 12 in. diameter, accurately cut to imprint 9 exposures on the plate. Steel axle, long G.M. bearings and driving pulley. Black celluloid finish Complete, as shewn, £5. Driving Motor, £3 10s. Exposing Candle, 1/-.

READING PHOTOMETER. All measurements exactly in accordance with the H. and D. Specifications, but in stout je panned metal, with all parts exposed to heat from lamps thoroughly protected by asbestos boards and air-spaces. The sight box (fitted with rack and pinion) can be lifted off bar for other uses, such as calibration of electric lamps against a standard candle. Spot indicator and mirrors easily removable for cleaning. Logarithmic Scale, Engine divided on ivory, reading direct without calculation. The lamps may be oil, albo-carbon, or electric lamps (latter recommended). Price complete, with lamps. £5.

THE MYRIOSCOPE



THE UNIVERSAL CAMERA FOR THE AVIATOR, THE MOTORIST, THE TRAVELLER & YACHTSMAN

SANGER SHEPHERD&G LP LONDON.

THE MYRIOSCOPE.



A compact, portable, photographic instrument of great precision, fitted with paired Zeiss Tessar anastigmats of correct angle for comfortable STEREOSCOPIC vision. By a clever device one objective can be moved instantly to the optical centre of the plate for PANORAMIC or PANEL pictures, the stereo-partition automatically collapsing. In this position the lens still covers the plate efficiently.

The MYRIOSCOPE is particularly adapted for the use of AVIATORS, MOTORISTS, YACHTSMEN and others, because it is portable and presents all objects in their true perspective; because it is always ready for immediate use and gives an accurate idea of distance and dimension to all details; and because the panoram-picture encloses the oft-required stretch of countryside, sea or sky, and incidentally frames a near view of an

aeroplane, automobile, or Admiralty cruiser!

Owing to the perfection of the Optical system, the MYRIOGRAMS appear to render all objects full-size and in relief as the eye sees them, a result at once pleasing and of great practical utility in placing say an airship, or other object at its correct apparent distance from the observer. The stereo-negatives are also suitable for Contact Lontern Slides, thus the episodes of a tour or function are available for the winter lecture. With their critical definition they enlarge to whole-plate paper prints, the panoramic negatives giving effective pictures fifteen inches in length.

From the foregoing it will be seen that this little camera, designed equally for use either in the hand or on a stand, may be put to a great variety of uses and, with its accessories, forms a universal photographic instrument, easy to manipulate, yet capable of producing from a single magazine:—

12 Stereoscopic transparencies (Myriograms), or

24 Contact lantern slides, or

12 Panoramic or panel transparencies, or

24 Half or whole plate prints, or

12 Panoram Paper prints, 15 ins. x 7 ins., or Stereoscopic or panoramic Autochromes in colours, or, of course, any combination of the above, or

Myriograms by flashlight indoors, or at night.

Of two Myrioscopes used to compose this leaflet cover, the second one did the photography.

THE 7EICS TESSAD COLUMNIA LENGER AND HOU

- THE ZEISS TESSAR FOCUSSING LENSES are coupled with the correct focal distances engraved on the junction bar, and the diaphragms are also coupled, and apertures marked.
- THE SHUTTER is of high efficiency and gives time and instantaneous exposures from 2 secs to 1/250th sec. It is actuated by special form of hair trigger, or by antinous release.
- THE FINDER is of special levelling direct vision pattern, and automatically encloses the actual view, whether the front is raised or lowered; a cross-ruled focusing glass is also provided.
- THE MAGAZINE takes 12 thin plates 5\(^1_8\) x 2\(^3_8\) in sheaths, and is extremely simple to use, and practically instantaneous in action. There are no loose slides to draw out. It may be removed from the Camera at any time, and either one or a dozen plates exposed or developed at will.
- DOUBLE DARK SLIDES are supplied if preferred, and for Colour Photography either a Special Autochrome Plate Holder or the Sanger-Shepherd Repeating Back can be used.
- THE TRIPOD of light rigid pattern, in Aluminium, is strengthened with brass on wearing surfaces, and has a clamping universal head. admitting of instant levelling, or dropping to change plates.
- TELEPHOTO ATTACHMENT, Magnifiers and Negatives, Autochrome Screens and Light Filters, are stocked to fit the lenses.
- CONSTRUCTION. The front working parts of the Camera are highly finished in enamelled light metal, and the body is of 3-ply wood, proof against Climatic changes, and neatly covered in black Morocco leather, the whole forming a handsome little appliance, which may be carried over the shoulder in a black solid leather case, in a manner similar to a field-glass, which it also resembles in its readiness for action.
- THE PRICE of the complete instrument, with paired Zeiss Tessar lenses, panoramic action, levelling finder, focusing glass, and magazine for 12 thin plates, antinous release, lens caps, and solid leather velvet-lined case and sling, is £23.

For Accessories, see overleaf.



Myrioscope Snapshot. Latham's Aeroplane after his sensational flight in gale. Blackpool, 1909.

LENS FITTINGS FOR THE MYRIOSCOPE.

Autochrome Screens, in special mount and leather case, per pair, £1 1s.; Light Filters (S.S.), ditto, 17/6; Portrait Magnifiers, ditto, 17/6; Negative Lenses for use with Sanger-Shepherd Repeater, 17/6.

PLATE HOLDERS.

Extra Magazine for 12 Plates, with Sheaths, £4 4s. Double Dark Slide, with Roller Blind Shutters, each 15/-.
Special Single Slide for Auto:hromes, Roller Shutter, 15/-. Film registers correctly.

TRIPOD STANDS.

Myrioscope Tripod Stand, light rigid model closing to zo-in., with triangular section aluminium legs, brass strengthened, and universal head for instant levelling, £1 7s. 6d. Tripod Stand, light brass, collapsible pattern and ball head, 12/6.

Thin Glass. PLATES FOR THE MYRIOSCOPE. 5\(\frac{1}{8} \text{ x } 2\(\frac{3}{8} \text{.} \)

Ilford Special Rapid for general work, per dozen, 1/3.
Ilford Monarch for flashlight and very high speed, per dozen, 1/9.
Sanger-Shepherd Rapid Colour—Anti-Halo, Highest Colour sensitiveness, fine grain, dustless backing, on thin glass, for very best work, per dozen, 2/3. Autochrome Plates, per box of 4, 2/8; cover glasses for same, dozen 9d.

Ilford Special Lantern for Myriograms, per dozen, 1/-; will sepia-tone nicely.

Paget Phosphate for warm tone Myriograms, per dozen, 1/6.

MYRIOGRAM VIEWING APPLIANCES.

Well made mahogany, square corners focussing lenses, 15 6 and 30/- each. Very Best, Black Leather covered, with Achromatic high magnitying lenses, separating and focussing, suited to Myrioscope optical system, each £3 10s. in Pattern, 50 views, £5. Particulars of large classifying Viewers on application. Chain Pattern, 50 views, £5.

DEVELOPING AND PRINTING.

Developing Dish (porcelain), divided for developing 4 plates at a time, 2/6.

Myrioscope Developer, 20 oz. concentrated solution, ready for immediate use for negatives. Myriograms, slides or prints, per bot., 2/6. Transposing Frame for Myriograms, 6/9. Enlarger (collapsible cone) for making Bromide Prints from Steroscopic or Panoramic, Myrioscope negatives, 10 x 5-ins. £1 15s. Ditto, best lens, polished cone, £3 10s.

Carefully developing clients' exposures, per dozen, 8/-.
Varnished Myriograms correctly transposed from ditto, per dozen, 12/-.

Straight Sepia enlargement, unmounted, about 6 x 5, 1/-. Ditto, Panoram, about 10 x 5, 2/-Spotting, retouching, mounting and reframing according to style.

Many appliances suited for use with this little Camera cannot be detailed in this limited space. For complete list see the "Book of the Myrioscope" (now in preparation) or inspect its very varied work exhibited at our Showrooms.





'KENTMERE

SENSITIZED

Paper & Card.

[See Inside.]





Do you use Sensitized Papers or Post Cards P

We want to get in touch with every user of either Bromide, Gaslight or P.O.P. papers or cards, at home or abroad. We believe we can make you a saving decidedly worth while. . . .

We supply many of the largest users in the world, and we could supply you, with first quality goods at low rates. We are actual makers of high-grade goods, and we can guarantee quick delivery at right prices. Remember we don't either make or sell rubbish. Let us send you samples and prices

Kentmere Ltd., Staveley, Westmorland.

of anything you use. . . .



Some "Kentmere" Products.



"KENTMERE" P.O.P. Papers and Post Cards.

do. Gaslight do.

do. Self-Toning do. do. "Phixa" do.

All made with glossy, matt or carbon surfaces.

Kentmere "ART" Bromides—smooth matt, and rough.

"Kentmere-Ivorettes"—made with P.O.P., Gaslight, Bromide, Self-Toning and "Phixa" emulsions, and in glossy, matt or carbon surfaces—all sizes.

[&]quot;KENTMERE" REDUCING SALT, 6d. per case.



[&]quot;Kentmere" Developer is a powder developer for Gaslight or Bromide papers which prevents surface marks. It is the best developer for papers made. Price 9d. per bottle.

[&]quot;KENTMERE" ACID FIXER, 6d. per case of 6 cartons.

[&]quot;Kentmere" Blox, for blocking out, 9d. per bottle.

[&]quot;Kentmere" Retouching Medium, 1/- per bottle.

[&]quot;Kentmere" Negative and Film Varnish, 1/- per bottle.

[&]quot;Kentmere" Matt Varnish, 1/- per bottle.



"Kentmere" Sensitized Papers and Post Cards

offer a higher quality for less money than any other papers.

A perfect surface—either matt, glossy or carbon.

A very long range of tone with perfect rendering of all detail.

Good contrasts.

A stout heavy base.

Great rapidity but easy manipulation.

What more could you wish?

Try it.

Send for our Price List. .



Foreign & Colonial Agents wanted where aot already represented.

Kentmere Ltd., Staveley, Westmorland.

YoigHänder

NEW METAL

HELIAR REFLEX CAMERA



14-Plate or 9×12 c/m. 4 VIDA 7 14-Plate or 9×12 c/m.

With Heliar Lens, F 4.5.

The "Vida" is the most perfect of all Reflex Cameras, comprising

EFFICIENCY, COMPACTNESS, AND DURABILITY.

It has the following advantages:-

- I. The Camera is constructed entirely of light metal.
- 2. The focussing hood erects itself automatically.
- 3. The Apparatus is fitted with a Self-Capping Focal Plane Shutter, which is released by gentle pressure.
- 4. The Mirror and Shutter are set simultaneously.
- 5. An Extension Adapter can be fitted to the front for using lenses up to 14 inches focus.

PRICES.

Size of Plate.	Lens.	with 3 Double	Camera with 3 Folding Double Dark Stides, Book Form, Code Word.	Camera with 3 Double Dark Slides with Vulcanite Shutters. Code Word.	Camera with Magazine for 12 Plates. Code Word.
1-Plate, or 9 × 12 c/m.	Heliar 18 c/m. 7½ ins. F 4.5	£21 5 0 Festvida	£21 15 0 Holzvida	£21 15 0 Guvida	£22 13 0 Wexvida



Size of Plate.	Dimensions of Camera.	Lens	Camera with 3 Folding Double Dark Slides, Book Form, Code Word.	3 Double Dark Slides with Vulcanite Shutters. Code Word.	Camera with Magazine for 12 Plates. Code Word.
$\begin{array}{c} 2\frac{1}{2} \times 3\frac{1}{2} \\ 6\frac{1}{2} \times 9 \text{ c/m.} \end{array}$	$5\frac{1}{4} \times 5\frac{1}{4} \times 6$ ins.	Heliar $13\frac{1}{2}$ c/m. $5\frac{3}{8}$ ins. F 4.5.		£16 5 0 Kleinspigl	£16 17 0 Sexwek
	••	Ditto with Telephoto attachment.	••	£19 5 0 Kleitespigl	£19 17 0 Sextespigl
½-Plate or 12 × 16½ c/m.	10×10×8½ ins.	Heliar 24 c/m. 9½ ins. F 4'5	£30 0 0 Gropigel	£30 0 0 Grogus- pigl	£31 10 0 Growespigl
••		Ditto with Telephoto attachment	£34 10 0 Grotespigl	£34 10 0 Grogutel	£36 0 0 Growektel
Stereoscopic $1\frac{3}{4} \times 4\frac{1}{4}$ ins. or 4.5×10.7 c/m.	4×4×63 ins.	2 Heliars 85 m/m. F 4.5		£20 0 0 Sterespigl	£20 14 0 Sterewex

Cost of Mechanical Release, 5/- extra.

Solid Leather	Sling	Case for	Camera	and three Double Dark Slides, 20/-) 21 × 31 or
21	,,	11	2.1	six Double Dark Slides, $25/ \frac{61}{2} \times 9 \text{ c/m}$
11	11	12	2.7	three Double Dark Slides, 38/-\ 2-Plate or
11	,,	,,	21	six Double Dark Slides, 40/-5 12 × 16½ c/m
17	12	77	1)	three Double Dark Slides, 20/- Stereoscopic six Double Dark Slides, 25/- $\frac{13}{4.5} \times 4\frac{1}{4}$ ins.

Yoig4länder

Metal Spring Camera "Salta"

WITH

Improved Patented Focal Plane Shutter (Self-Capping).

 $\frac{1}{4}$ -Plate, or 9 × 12 c/m. $\frac{1}{2}$ -Plate, or 13 × 18 c/m.

Press one lever and the Camera is ready for Exposure.



This Camera is the most perfect apparatus of the Folding Focal Plane Type that has yet been manufactured; it has the advantage of being instantly brought into position for exposure by simply pressing the small lever to the right of the finder, this releases the finder and the Camera front which spring into position. Another advantage is the Self-capping Focal Plane and Shutter which is easily manipulated and can be set when the sheath of the dark slide has been drawn out and put in position.

Fitted with Voigtländer Lens in Focussing Mount.				With 3 Double Dark Slides, Solid Form with extractable Vulcanite Shutters, or Book Form with folding Wood Shutters.		
c/m	£	s.	d.	£	S.	d.
/ Dynar 13½, F 6	13	10	0	14	0	0
Collinear III., 132, F 6.8	14	15	0	15	5	0
Collinear II., 132, F 5'4	15	10	0	16		0
Heliar 11., 18½, F 5'4 Heliar 18, F 4'5 Telephoto Attachment A.	15	10 ,		16	0	0
For Objectives 13½, c/m	3	5	0			
ng ∞ o o o o o o o o o o o o o o o o o o	3	5	0			
Dynar 18, F6				16	15	0
Collinear III., 18, F 6.8				18	0	0
D				20	0	0

Excelsior Telescopic Tripod, Brass, 11/6; Aluminium, 18/-

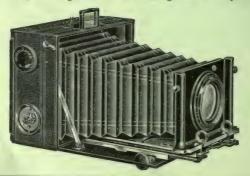
Improved Patented Focal Plane Shutter (Self-Capping).

1-Plate, or 9 × 12 cm. Continental size only.

This Camera is constructed of Light Metal similar to the Voigtländer Metal Folding Camera, and for high-class workmanship and mechanical ingenuity is unsurpassable. The Heliar Camera is fitted with a Focal Plane Shutter of similar construction as in the Folding Camera. The Lens generally supplied with this Camera is an 18 cm. Heliar 71 ins. focus. This Lens has already made a great name for itself in the Photographic world, working at a full aperture of F 4.5. It is suitable for all the requirements of general Photography, and is the best of all modern Lenses.

The Camera is fitted with Rack and Pinion Focussing movement with extension to 11 ins., enabling Lenses of various Focal lengths to be used.

A Lens Shutter can be fitted to this Camera in addition to the Focal Plane if desired, enabling the user to obtain a greater variety of exposure.



With Voigtländer Lens in Countersunk Mount.

Camera with 3 Double Dark Slides, Solid Form with Folding Wood Shutters.

Camera with 3 Double Dark Stides, fitted with extractable Ebonite Shutters or Book Form with Folding Wood Shutters.

Heliar 18cm., 7 ins., F 4.5 Collinear II. 15cm., F 5.4

£16 0 14 15

£16 10 0 15 5 0

Dimensions when closed, $6 \times 5 \times 2\frac{5}{9}$ ins. Weight, without Lens, 2lbs. 9 ozs. Telephoto Attachment to above Camera, £3 10s. Leather Case for Camera and 3 Dark Slides, 18/-

Excelsior Telescopic Tripod - Brass, 11/6 .. Aluminium, 18/-

YoigHänder

STEREOPHOTOSCOPE.

New Model fitted with Sector Shutter for time and instantaneous exposure up to $\frac{1}{2000}$ sec.



The "Stereophotoscope" will produce the most perfect Stereoscopic pictures upon plates $4\frac{1}{4} \times 1\frac{3}{4}$ inches, 4.5×10.7 c/m. The body is constructed from one piece of metal, and it is, therefore, most suitable for warm or damp climates. The Lenses are fitted in focussing mounts. The Magazine Changing Box carries 12 plates, and has an automatic counter showing number of plates used. A Film pack holder can also be supplied. Stereophotos when viewed through the special size Stereoscope are magnified, and appear as large as the ordinary size Stereoscopic Views. The whole apparatus is of the very highest class workmanship.

The Lenses are fitted with Iris Diaphragms, both of which can be

regulated by one movement	PACIT	hatel	har one	movem	ont
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regulated by one movement.	Prices.	Code Word.
Price of Voigtländer "Stereophotoscope." with two "Heliar" lenses, F 45, correctly paired, two view finders, changing box, and leather sling case complete	£ s. d.	Photoskop
Ditto with two Collinear Lenses III., F 6.8	17 10 0	Cofotoskop
Vertical Rising Front (Heliar Lenses)	2 10 0	Vertoskop
" " " (Collinear Lenses)	2 10 0	Coverskop
Extra magazine for 12 plates	4 0 0	Fotmagazin
Adapter for Single Nickel Dark Slides	8 0	Fotodapter
Six Single Nickel Dark Slides in case	10 0	Nickeletui
Film Pack Holder	1 10 0	Fotpack
Stereoscope with Achromatic lenses for viewing the transparent "Stereophotoscope" views	1 0 0	Fotostereo
Reversing Frame for making the Stereoscopic Positive without cutting the Negative	8 0	Stereoram

All our "Stereophotoscopes" are engraved with the name Voigtländer. Size of Stereophotoscope complete, $5\frac{1}{5} \times 4 \times 2\frac{3}{5}$ ins. Weight, 1 lb. 15 oz.



. The .

Voigtländer

Alpine Camera,

3-Plate, or 9 × 12 cm. Postcard $5\frac{1}{2} \times 3\frac{1}{2}$ ins. or 10×15 c/m

For Plates or Film Pack.

Especially suitable for use in Tropical Climates.

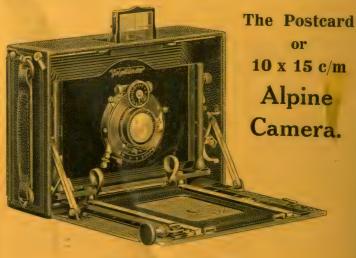
This Camera is entirely constructed of LIGHT METAL, and is fitted with a Voigtländer Lens, in Koilos or Compound Shutter. It weighs 1 lb. 11 ozs. 4-Plate size, 2 lbs. 10 ozs. Postcard size.

In consequence of the very long triple extension, work can be done with the Back Combination of the Collinear Lens.

This Camera can be fitted with a telephoto attachment which has been especially designed to screw inside the camera. This form will be seen to be a great advantage for producing good telephoto work.

The Postcard size or 10 × 15 c/m Camera can be supplied fitted for Panoramic or Stereoscopic work.

The measurements of the apparatus are $5\frac{3}{4} \times 4\frac{3}{8} \times 1\frac{1}{2}$ inches $\frac{1}{4}$ -Plate size, $7\frac{1}{8} \times 4\frac{3}{4} \times 1\frac{1}{4}$ 21 inches Postcard or 10 × 15 c/m size.



For Prices see next page.

29 10 0

3 10 0

Yoigsländer Alpine Camera

PRICES.

 $\frac{1}{4}$ ·Plate or 9 \times 12 c/m. Size.

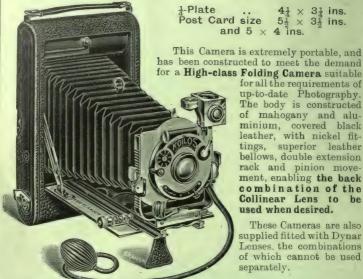
£ s. d. Camera with Collinear Lens Series III., 12 c/m., in Koilos or Compound Shutter, six Single Metal Dark Slides and Focussing Screen 11 10 0 Ditto, with Collinear III., 12 0 0 Ditto, with Dynar 12 c/m. Ditto, with Dynar 13½ c/m. ... Ditto, with Dynar 15 c/m. ... Telephoto Attachment, giving a magnification of 21 times Film Pack Holder, 1-Plate ... Contrast Filters, A, B, or 17 6 Orange, each Solid Leather Sling Case for Alpine Camera and 6 Slides 10 6 Postcard $5\frac{1}{2} \times 3\frac{1}{2}$ inches. 10 × 15 c/m. or Stereoscopic Size.

linear III., 15 c/m., giving a magnification of 2½ times ... Solid Leather Sling Case for Camera and 6 Slides

The Stereoscopic Alpine Camera.

Excelsior Telescopic Tripod—Brass, 11/6 ... Aluminium, 18/-

Hander ROLL FILM AND PLATE CAMERAS



 $4\frac{1}{4} \times 3\frac{1}{4}$ ins. Post Card size $5\frac{1}{2} \times 3\frac{1}{2}$ ins. and 5×4 ins.

> for all the requirements of up-to-date Photography. The body is constructed of mahogany and aluminium, covered black leather, with nickel fittings, superior leather

bellows, double extension rack and pinion movement, enabling the back combination of the Collinear Lens to be used when desired.

These Cameras are also supplied fitted with Dynar Lenses, the combinations of which cannot be used separately.

1-Plate Camera, fitted with Collinear Lens, Series III.,	£	8.	d.	
12 c/m, F 6.8, and Koilos or Compound Shutter	10	0	0	
Ditto, with Dynar Lens, 12 c/m, F 6	8	15	0	
Dimensions, closed, $8 \times 4\frac{1}{2} \times 2$ ins.; weight, 2 lbs.				
Postcard Size Camera, fitted with Collinear Lens,				
Series III., 15 c/m., F 6.8, in "Koilos" or Compound	12	0	0	
Shutter		-	0	
Ditto, with Dynar Lens, 15 c/m, F 6	10	15	U	
Dimensions, closed, $9\frac{1}{2} \times 5 \times 2$ ins.; weight, 2 lbs. 14 ozs.				
5×4 ins. ditto, Collinear III., 13\frac{1}{2} cm	10	15	0	
Ditto, with Dynar Lens, 15 c/m, F 6	10	5	0	
Dimensions, closed, $9 \times 5\frac{1}{2} \times 2\frac{1}{2}$ ins.; weight, $2\frac{3}{4}$ lbs.		_		
These prices include 3 single metal dark slides and focussing				
screen, fitted with hood cover, in case.				
Black or Brown Solid Leather Sling Case with lock and	1			
key, for carrying Camera		7	6	
Extra Set of 3 Single Metal Dark Slides, 3-Plate, in Case		6		
D:11 3:11- D-13		7	6	
Ditt.		7	6	
The state of the s		-	_	
Excelsior Telescopic Tripod - Brass. 11/6 Alumin	ium,	18/	-	

Voighländer Field Cameras.



MODEL A.

This Camera is of superior construction. The extension is done by double rack and pinion movement. Lightness and portability have not been secured by weakening any part of the Camera, but by eliminating brass and wood from places where they served no useful purpose, and in consequence great rigidity is guaranteed. The Camera is made of the finest seasoned Mahogany, with polished and lacquered brass bindings.

Model A

English.	Extension.				Dark Slide.			
1115. $3\frac{1}{2} \times 5\frac{1}{2}$ $4\frac{4}{4} \times 6\frac{1}{2}$ $6\frac{1}{2} \times 8\frac{1}{2}$	c/m 10 × 15 13 × 18 18 × 24	ins. 14 16 24	£ 5 5 6	s. 5 5 15	d. 0 0	0 0 0	s. 15 15 18	d, 0 0

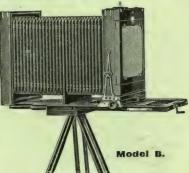
The two first sizes are fitted with Stereoscopic division.

Model B. Triple Extension. Front extended by a Screw, and the back by Rack and Pinion.

Specially Brass Bound, for Use in Hot Climates.

The screw extension movement, fitted for racking out the front, is so arranged that when extended the Camera is always balanced on its stand.

 $6\frac{1}{2} \times 4\frac{3}{4}$ ins. and $8\frac{1}{2} \times 6\frac{1}{2}$ ins. sizes, with Stereoscopic Division, if desired.



Voigsländer Heliar Lens.

A brilliant
Anastigmatic
Objective,
working at a
full aperture of
F 4-5
in all sizes.



Professional
Photographers
use the
"HELIAR."

Equiva- lent Focus.	Diam. of Lens.	Size of Plate sharply covered F 4.5.	Price.	Code Word.	Counter- sunk Mount.	Code Word.	Focussing Mount.	Code Word.
c/m ins. 2 8 8 2 3 8 1 1 2 4 5 8 1 1 2 1 3 2 1 5 6 1 8 7 8 2 4 9 1 3 2 1 6 2 4 1 6 2 4 1 6 2 4 1 6 2 4 8 1 9 6 0 2 4	m/m 11 19 27 31 33 40 54 67 80 93 107 132	ins. 1 1 × 2 2 × 2 3 ½ × 2½ 4 ½ × 3¼ 4 ½ × 3¼ 7 × 5 8 ¼ × 6 1 × 7 10 ¼ × 8¼ 12 × 12	£4 0 0 4 15 0 5 10 0 6 0 0 6 5 0 8 0 0 13 0 0 18 0 0 24 0 0 31 0 0 37 10 0 75 0 0	Fiasco Fiber Fibrin Fibro Fibrinosus Figella Finota Firna Fiscano Fiscal Fistel Finger	£3 15 0 6 5 0 6 10 0 8 5 0 13 10 0	Fixage Fibrund Fibroso Filigran Finte	7 0 0	Fiscos Fibrano Filiorum Figurina Finale

The cost of pairing two "Heliars" for Stereoscopic work is 8/-

The "HELIAR" LENS is acknowledged by Professional Photographers in all parts of the world to be the finest Anastigmat Lens yet produced. Working at the full aperture of F 4.5, pictures can always be made even in the dullest light, while for portraits and groups it is unrivalled for its beautiful definition. Quarter-plate pictures can be enlarged to 34×47 inches without material loss of detail and definition.

A large variety of work done by this Lens can be seen at the London Branch, 12, Charterhouse Street, Holborn Circus, E.C.

HELIAR LENSES, $5\frac{1}{2}$ c/m and $8\frac{1}{2}$ c/m, are used by all the Continental and English Makers of Cinematograph Films.

The "HELIAR" LENS is THE Lens for Reflex Cameras. There is no finer work done than with the "Heliar."

The "HELIAR" LENS is a favourite with Press Photographers.

"COLLINEAR" LENS.

The "COLLINEAR" LENS may well be styled "The Perfect Lens," although one of our earliest and best known type of Anastigmat lenses, it is more popular in the photographic world of to-day than ever. It is peculiarly suited for both amateur and professional photographers, and there is no work for which the "Collinear" is unsuitable.

"Collinear" Lenses are symmetrical, the front and back combination being exactly the same focus, either can be used separately, and each in itself is a corrected achromatic anastigmat, giving searching definition. The detail in photographs taken with either or both combination of this lens is remarkable.

We supply "Collinears" to fit Kodak Hand Cameras so mounted that they can

We supply "Collinears" to fit Kodak Hand Cameras so mounted that they can be fitted by the purchaser into the shutter of his camera. No alteration in the camera or shutter is necessary. A correctly marked diaphragm scale is supplied with each set.

When ordering specify which type of shutter your camera has.

"COLLINEAR,"
SERIES II.

Brunschreit

Full Aperture.
6 cm. to 20 cm.,
F 5.4.

25 cm. to 60 cm., F 6·3.

Equiva-	ens.		t Plate covered.	Ordinary	Code		ersunk unt.		unt.
lent Focus.	Diameter of Lens.	At Full Aperture.	Stopped Down.	Mount.	Word.	Price.	Code Word.	Price.	Code Word.
cm. ins. 23 23 23 23 23 23 23 23 23 23 23 23 23	mm, 11 13 17 23 26 29 38 40 48 58 70 82	9 × 7	4	£ s. d. 4 10 0 4 10 0 5 0 0 5 15 0 6 5 0 6 5 0 9 0 0 11 0 0 15 0 0 27 0 0 34 0 0	Galen Galeotto Gandara Gaston Gatter Gawein Gemma Georgia Ginster Gorgone Gudrun Guntram	£ s. d. 5 5 0 6 0 0 7 0 0 9 8 0	Gabes Gaflun Galmei Gambia Gaza	£ s. d 5 18 0 6 10 0 7 0 0 7 10 0 10 0 0	Nager Narcose Narcin Nauders Negus

7 cm. & 9 cm. are the lenses specially made for Cinematograph work.

The cost of pairing two Collinears for Stereoscopic Work is 8/-

Voigtländer Collinear SERIES III.

Full Aperture.

7 cm. to 18 cm., F 6'8.

20 cm. to 58 cm., F 7.7.

Equiva	meter Lens.		f Plate covered	Ordi- nary	Code Word.		ersunk unt.		ssing unt.
Focus.	Diar	At Full Aperture.	Stopped Down.			Price.	Code Word.	Price.	Code Word.
cm. ins 7 2 9 3 12 4 13½ 5 15 6 18 7 20 8 25 10 31 12 37 14 17 52 20 58 23	11 14 18 20 23 28 27 34 40 47 57	ins. 2½ × 1¾ 3½ × 2½ 4½ × 3¼ 4½ × 3½ 5½ × 5½ 9 × 7 12 × 10 15 × 12 18 × 12 20 × 14	7 × 5½	4 5 0 5 0 0	Hadramaut Hagar Hakon Halde Halma Hassan Hatto Hella Hestia Honduras Horus Hulda Hutten	£ s. d. 4 10 0 5 5 0 7 10 0 8 5 0	Hebe Hedwig Hegar Helga Helm Heliodor	£ s. d. 5 0 0 5 18 0 6 5 0 6 15 0 8 0 0 8 15 0	Narbo Nathan Natter Neckar Nelda Nenner

Cost of pairing 2 Collinears for Stereoscopic Work is 8/-

SERIES IV.

Full Aperture, F 12.5.



Wide-Angle Anastigmat for Architectural, Process Work, and Landscapes.

The Wide-angle Collinears give, with full aperture, a field of view of about 85°. When stopped down, 95°.

Equivalent	Focus.	Diameter of Lens.		of F		Stopp		ered. Down.	Pri	ice.	Code Word.
cm. 10 12 15 20 25 32 44 58 80	ins. 4 44 6 8 9 4 4 1 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1	mm. 8 10 12 16 21 26 35 46 65	44 5 5 6 5 5 5 6 5 5 5 6 5 5 5 6 5 5 5 6 6 5 5 5 6	ins. × × × × × × ×	3½ 4 4¾ 6½ 7 8 10 12	6½ 7½ 8½ 10 12 14 15 24 28	ins. × × × × × × × ×	48 5 61 8 10 11 12 18 22	5 5 1 6 9 12 20 30	s. d. 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Kabale Kabul Kallias Kandahar Kaste Kondor Konon Korfu Kuno

igsländer 'Dynar' Lens.



The "Dynar" Lens aperture F 6.
The construction of the "Dynar" Lens is now well known amongst amateurs requiring an anastigmat for hand or field camera use, working at a full aperture of F 6. This lens is noted for its great light transmitting power, uniformity of definition, and brilliancy of its pictures.

Its formula consists or three separate lenses so arranged as to obtain extreme rapidity, and is excellently adapted for rapid instantaneous exposures, while its ex-tremely low price brings it within the reach of all serious amateurs.

The "Dynar" Lens can also be had

to fit Kodak Cameras mounted in the the "Collinear" (see page 1073) at the following prices:— For No. 3 F. P. Kodak "Dynar" F 6 125 m/m .. £4 0 0 .. £4 15 0

	Equi		ameter Lens.	Size of shar covered	ply i with	Ordin			Count	ers	sunk Mount.	Foci	ussi	ng Mount.
-	Foc		Dian of I	full ape		Mou	nt.	Word.	Price	÷.	Code Word.	Price	е.	Code Word.
	12 13½ 15 18	ins. 44 52 6 78	m/m 21 24 26 32	ins 44 × 5½ × 6 × 7 ×	31 4 4 4 2 5	£ s. 3 15 4 5 4 15 6 0		Dyn Dyro Dysis Dytes	4 10 5 0	d. 0 0 0	Dynein Dyroein Dysisein Dytesein	£ s. 4 10 5 0 5 10 6 15	d. 0 0 0	Dynarch Dynarch Dysisarch Dytesarch

The cost of pairing two "Dynars" for Stereoscopic Work is 8/-

Voigtländer Telephotographic Lenses

Special Lenses and Cameras for Telephotography.

Every degree of magnification may be obtained, according to the distance the Lens is placed from the plate. The image is from three to four times as large as that obtained by an ordinary Lens of the same focus as the Camera extension. An image

ten to twelve times larger than that of the Positive Lens alone, can be obtained sharply defined.

The Telephotographic Lens is recognised as forming an essential part of the Photographer's outfit, as it gives himwithin certain limits-a considerable range of foci to make the subject as large as he chooses.

PRICES.-The cost of complete Telephoto Lenses may be found by adding the cost of the Positive Lens selected to that of the Telephoto Attachment.



TELEPHOTO ATTACHMENT.

No.	Price.
1	£4 0 0
2	4 0 0
3	4 5 0
4	4 15 0
5	5 10 0

VoigHänder

Portrait Lenses. SERIES Ia.

Full Aperture F 2.3.

Extra Rapid Objectives for Portraits & Cinematograph Work.

	valent eus.	Diameter of Lens.	Diameter of Useful Field.	Size of Picture.	Price.	Code Word.
em 8	ins.	mm. 36	ins.	Cinematograph	£ s. d.	Adler
10	41/8	46	15	"	6 0 0	Agathe
15	6	64	21	C.D.V. Bust	8 0 0	Aller
20	778	84	23	C.D.V. f. length	12 0 0	Andora
30	$11\frac{1}{2}$	128	4	Cabinet Bust	30 0 0	Argus

These objectives, from 8 cm. to 20 cm., are fitted with Iris Diaphragms, the 30 cm. has Waterhouse Diaphragms; price of extra set Waterhouse Diaphragms, 25/-

Portrait Lenses. SERIES I.

Full Aperture F 3:16.

Modified Petzval Lens. For Portraits and Projection.

	valeni cus.	Diameter of Lens.	Suitable for	Pı	rice		Code Word.	Price of	Waterhouse	Diaphragms.
em.	ins.	mm.		£	8.	d.		£	s.	d.
17	63	53	C. D. V. Bust and (6	0	0	Barbara		15	0
21	81	66	Children 1	9	0	0	Belisar		17	0
25	91	79	C.D.V. bust & full length	13	0	0	Bergamo		19	0
31	12	92	Cabinet	18	0	0	Beowulf	1	2	0
40	15	105	Boudoir	24	0	0	Bramarbus	1	5	0

All Portrait Lenses, Series I. are supplied with Waterhouse Diaphragms; the 17, 21 and 25 cm. are fitted with rack and pinion.

YoigHänder

Portrait Euryscope Lenses.

SERIES III. Full Aperture F 4.5.

Equiv Foo	valent	Diam. of Lens.	Size.	Price	э. 1	Code Word.	Price of a of Waterh Diaphrag	ouse
em. 17	ins. $6\frac{3}{4}$	mm. 40	C.D.V.	£ 8. 4 10	d	Cadmus	£ s.	d. 0
20	$7\frac{3}{4}$	46	"	5 10	0	Catalonien	14	0
22	81/2	53	,,	7 0	0	Catania	15	0
28	11	66	Cabinet	10 0	0	Ceder	17	0
35	134	79	19	14 0	0	Centaur	19	0
40	16	92	Cab. & Boudoir	20 0	0	Certosa	1 2	0
51	20	105	. 22	26 0	0	Cimon	1 7	0
66	26	135	Boudoir, Imperial, &c.	47 10	0	Cibele	1 14	0

All these Lenses are supplied with a set of Waterhouse Diaphragms.

YoigHänder Euryscope Lens.

SERIES IVa.

Full Aperture F 7.

					dir i-pe				
	valent cus.	Diameter of Lens.			covered. Down.		Price		Code Word.
em. 15	ins.	mm. 22	43	ins.	31	£ 3	s. 10	d. 0	Dingo
18	718	27.	$6\frac{1}{2}$	×	43	4	4	0	Divan
20	73	30	71/2	×	5	4	16	0	Dolman
25	93	38	81	×	$6\frac{1}{2}$	5	12	0	Dolus
30	113	46	9	×	7	6	18	0	Domina
36	141	55	10	×	8	8	12	0	Dorn
43	17	67	12	×	10	11	12	0	Duenna
50	191	77	14	×	11	16	10	0	Despina
66	26	104	15	×	12	26	0	0	Dessin
87	341	137	20	×	16	50	0	0	Dina

The Euryscope Lens for Universal use.

SEND FOR COMPLETE CATALOGUE OF PORTRAIT LENSES.

Voig4länder

NEW MODEL

PRISM BINOCULARS

GIVING ENHANCED STEREOSCOPIC EFFECT.



The New Model Voigtländer Prism Binocular with enhanced stereoscopic effect has the advantage of a simplified wheel focussing adjustment, enabling any user to quickly focus it. For ladies this is particularly convenient.

This glass is also manufactured with the eyepiece focussing only,

at a slightly lower price.

The Voigtländer Prism Binocular combines the highest optical and mechanical excellence, giving brilliant definition and exceptionally large field of view.

Insist upon seeing a Voigtlander before purchasing any other make.

PRICES COMPLETE IN LEATHER SLING CASE.

Ma	gnif	Bin	Wit	ular.		With		heel	nocu	lar	For	m.
X	6		£6	10	0	 £6	0	0		£3	0	0
×	6	large aperture	£8	0	0	 £7	10	0		£3	15	0
X	8		£7	0	0	 £6	10	0		£3	5	0
×	8	large aperture	£9	0	0	 £8	1)	0		£4	5	0
×	10		£7	10	0	 £7	0	0		£3	10	0
×	12	***	£9	10	0	 £9	0	0		£4	10	0

Send for Complete Catalogue of Field Glasses, etc.

QUALITY TELLS!

NOTHING SUCCEEDS LIKE SUCCESS

PAPERS,
PLATES

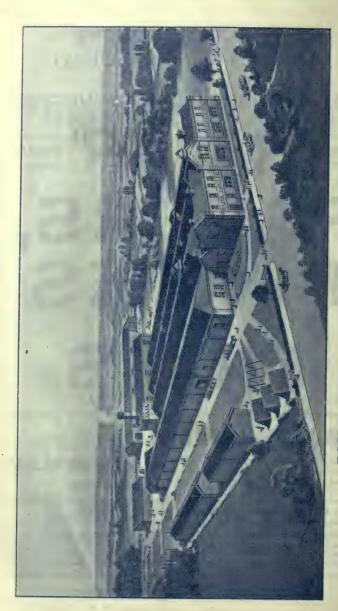
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STANDARD OF QUALITY.

NO DOUBLE TONES
LITTLE GOLD REQUIRED

No Enamelling Troubles.

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AND

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Cotta, Sepia, Brown &
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Fine Dark Tones from Purple-Brown to Purple-Black with a weak solution of Sulphocyanide.

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GRADES-Glossy, Matt and Semi-Matt.

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Most Modern Lithographic and Type Printing Machinery driven by Electric Power.

Nearly all the largest publishers of real Photographic Post Cards use "RAJAR" Cards, simply because of their exceptional quality; quality not only of emulsion, thus yielding the best results from even inferior negatives, but because the postal matter is so well printed as to show the Card to full advantage, and in sharp contrast to most other makes.

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The

All-British "Planex" Reflex

(New Model).

LONDON MADE THROUGHOUT.



The "Planex" is as near perfection as it is possible for a camera to be made. The picture is focussed full size up to the very instant of exposure, and the mirror is raised without the least sign of vibration. The extension is sufficient for using the single combination of the lens, or for telephoto work; the rising front is actuated by a rack and pinion, thus ensuring ease of work, combined with the quickness required in hand-camera work. The front, even when fully extended, is perfectly rigid, being fitted with side rack runners. The reversing back is of the revolving pattern, and can be adjusted from vertical to horizontal with ease when the

slide is in positi n ready for exposure. The focal plane shutter, of entirely new design, is adjusted from outside for any speed with ease and certainty, and gives exposures from ½ to a 1500 part of a second and time of any duration. The finder is fitted with an extra deep hood (3-fold), which is self-opening and is bound with plush so that it fits most comfortably round the forehead and eyes; thus all light is excluded and focusing is accomplished with absolute certainty. The reflecting mirror is surface-silvered and throws a true image upon the top ground glass in accurate register with the plate; the slides are double, with draw-out aluminium shutters.

Any suitable focus lens can be fitted.

The camera will take either Dark Slides, Changing Box, or Premo Film Pack Adapter all being interchangeable.

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81, Aldersgate St., London, E.C.

THE "PLANEX" REFLEX FOCAL PLANE CAMERA, No. 2.



Reflex in which the for cussing is done up to the moment of expo-sure. Rack and pinion focussing. Rising front. Suitable lenses of any make may be fitted, which are not altered in any way, and can be at once detached for useon other cameras or enlargers. is both smooth and silent. There is no vibration to cause blurred pictures by either mirror or shutter. Focussing screen is well protected

from light. Camera is very small and light, and measures in 1-plate size 6 in. by 61 in. by 7 in. Revolving reversing back. Mirror is silvered on surface, showing absolutely true image. An entirely new solvered on surface, showing absolutely title image. An entirely new focal plane shutter is fitted, and speeds ½ to 1/1300th second are given by altering from outside. Time exposures may be easily given without vibration. It takes either Dark Slides, Changing Box, or Premo Film Pack, all being interchangeable. Dark slides made of best ebony and aluminium bound. The Camera is of first-class. manufacture, and is covered in hard-grain Morocco leather, the frontbeing ebonised.

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The "PLANEX" REFLEX FOGAL PLANE CAMERA, No. 2.—cont. PRICES.

	1-plate.	5×4 plate.	½-plate.
	£ s. d.	£ s. d.	£ s. d.
Camera and 3 Slides only	7 7 0	9 9 0	10 10 0
Fitted "Blitz" Double Anastigmat, Series III., F/6·8	6 in.	7 in. 13 6 6	$8\frac{1}{4}$ in.
Fitted "Blitz" Double Anastigmat,	6 in.	7 in.	8½ in.
Series I., F/4·8	12 12 0 6 in.	15 15 0 7 in.	17 17 0 8½ in.
Fitted "Goerz" Dagor, F/6.8	13 12 0	16 14 0	19 5 0
Fitted "Goerz" Celor Anastigmat, F/4.8	6 in.	7 in.	8½ in. 19 15 0
Fitted "Goerz" Syntor Anastigmat,	6 in.	7 in.	8½ in.
F/6·8	11 ·2 0 6 in.	13 19 0 7 in.	17 0 0 8} in.
Fitted Ross "Homocentric," F/6.3	11 17 0	14 19 0	17 10 0
Fitted Ross "Homocentric," F/5.6	6 in.	7 in.	8½ in. 19 0 0
Fitted Zeiss Double "Protar," Series	6½ in. 16 11 0	8 in.	9½ in. 24 12 0
VIIa, F/6·3	6.8 in.	20 12 0 8 in.	9.8 in.
F/6·3	15 0 0 6 in.	18 12 0 7.6 in.	22 9 0 9 in.
II., F/6	13 15 0	17 13 6	20 10 0
Fitted "Cooke," Series III., F/6.5	6 in.	7½ in. 14 15 6	8·25 in.
	6½ in.	71 in.	9½ in.
Fitted Voigtländer 'Heliar," F/4.5 Fitted Voigtländer 'Collinear,'	13 17 0 6 in.	17 9 0 7% in.	24 0 0 8 in.
F/5·4	14 7 0	18 9 0	19 18 0
"Adon" Telephoto Lens, including fitting	3 10 0	3 10 0	3 10 0
Extra Double Dark Slides, each	11 0	12 0	15 0
Changing Box for 12 plates Mackenzie-Wishart Slides	2 8 0 8 0	2 14 0 10 6	3 15 0 12 6
Envelopes, each Premo Film pack, adapter leather	1 6	2 0	2 6
covered	10 6	12 6	14 6
Waterproof Tweed Case for Camera and 3 Slides	12 9	17 6	19 6
Solid Leather Case for Camera and			
*3 Slides	15 0	1 0 0	1.10 0

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The Folding Planex Reflex

THE CAMERA FOR 1910.

An Entirely NEW Departure.

After experiments extending over a lengthy period we have succeeded in producing a Reflex Camera combining the desirable features which have made the Planex so popular during the past five years with the small size and light weight of a Folding Camera, measuring only $3^{\prime\prime} \times 5_4^{\prime\prime\prime} \times 6_4^{\prime\prime\prime}$, and the approximate weight is only 21bs. 12 oz. The mechanical difficulties encountered have all been satisfactorily overcome, and the **Folding Planex** is now offered to the public in the fullest confidence that it will prove entirely satisfactory under ordinary working conditions.

Orders will be executed in rotation for quarter-plate size only, and delivery will be made early in March, while other sizes are in course of preparation. Prices and further particulars will be notified in the weekly journals in due course, or will be sent free by post to anyone interested on application.

The Leading Features of the FOLDING PLANEX, apart from the small size and weight, are:—

- (1) A 5½ inch Anastigmat can be used.
- (2) Rising Front, one inch.
- (3) Revolving Back for horizontal or vertical pictures.
- (4) A New Design of Focal Plane Shutter, with speeds ranging from the second to take and Time, with Antinous or Pneumatic release. The Shutter is absolutely the simplest piece of apparatus ever constructed, every adjustment of speed being made with one simple pointer only, and without the slightest chance of any difficulty being experienced, even by the most unskilled user.
- (5) Deep Hood, excluding all top light and giving the utmost brilliance on the screen.
- (6) Silver Surface Mirror, untarnishable.
- (7) Necessary movements reduced to the absolute minimum, thus before making the exposure, the only movements to be made are (a) wind the shutter and (b) pull out the front (automatically setting the mirror and raising the hood then (c) press the release.

It is the acme of simplicity, in conjunction with splendid workmanship and materials of the most reliable quality.

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The

'Autolox' Roll Film Camera.

For 4-Plate Films or Plates.

This is an entirely new design of Roll Film and Plate Camera, in which the difficulty of pulling out the Camera front and locking it on the track is entirely overcome.



The "Autolox" Camera, partly extended.

The entire base board, with lens front and struts, falls into infinity position and is rigidly locked with ONE SIMPLE MOVEMENT.

This movement is entirely automatic, and works with great mechanical accuracy. Covered in best leather.

The whole of the metal parts are heavily nickel-plated and polished, and the finish throughout is excellent in every detail.

The Camera is most compact in design, and free from projections.

duble extension, with Rack and Pinion, rising front, cross front, Infinity Catch, Focussing Scale, direct Brilliant View Finder, improved patent Spool Holders, Hooded Focussing Screen, and 3 Metal Dark Slides in Wallet.

"Double Aplanat" Lens-F/7.5 in Compound Shutter, speeds 1 to 1-250th second and time

PRICE								£	4	15	0,
Fitted with	5-in.	"Blitz"	Double	Anast	igmat,	Series	III., F/6	8, in	£	S.	d.
Compo	und S	hutter							8	5	0.
Fitted 5-in. (doerz,	" Dagor,	" F/6.8,	in Com	pound	Shutter			10	0	0
Fitted 5-in. I	Ross "	Homocer	trie," S	eries C	., F/6·3	, in Cor	npound		8	15	0
Fitted Zeiss	" Tess	ar" Serie	s II.B.,	F/6.3,	in Com	pound			9	10	0.
Leather Case	e, Bla	ck or Bro	wn							5	6
Extra Single	Meta	l Slides						each		1	6
		(ther L	enses fi	tted to	order.					

Other Lenses fitted to order.

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[See preceding and following pages;

THE "SALEX" POSTGARD CAMERA

For 51 by 31 Roll Films. For 51 by 31 Plates.



A Camera suitable for either plates or roll films, taking pictures 5½ by 3½ inches, any make of roll films may be used. It is well made of seasoned hard-wood, with aluminium folding base, double extension leather bellows, rack and pinion focussing, with locking arrangement. The fork of the front is of one aluminium casting, and is perfectly rigid; rack risin o front of entirely new design, and crossfront: the back is so con-

structed that the plate slides may be used without any additional back having to be carried. The spool holders are of entirely new design, and a back wind is provided so that the films are always kept taut and flat. The Camera is covered with hard grain leather and presents a handsome appearance. Automat Shutter giving exposures from 1 to 1/100th part of a second and time. Infinity catch and finder with level.

Fitte	d "Aplanat Lens," F/8 "Blitz" Double Anas-	5	s. 7	d. 0	"Zeiss Tessar," II.B, F/6·3	£	s.	d
	"Ross Homocentric,"	7			"Zeiss Protar," Series VII.A, F/6·3			
,,	F/6·3 "Goerz Dagor" Lens.				Focussing Screw with Hood Extra Plate Holders		5	
, ,,	F/6·8 "Cooke" Anastigmat, III., F/6·5				Leather Case, with Sling Strap		1 6	60 80
-		0 1		U	Koilos Shutter Extra	1	11	6

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THE 'SALEX' IMPROVED FILM CAMERA.

 $4\frac{1}{4} \times 3\frac{1}{4}$, for Roll Films or Plates.



Thoroughly well made seasoned mahogany covered in hard-grained morocco leather. Baseboard of aluminium. Ex-tremely rigid new form stays to front of camera. rack and pirion rising and falling front by means of a circular toothed plate engaging in rack of up-right stay, rigidly fixed instantly in any position. Cross front by means of new form of rack screw. Well finished in every detail. Carrying handle. Dr. Shraner's Rapid

Symmetrical, giving exquisite definition. Iris f/8. Double valve time and instant shutter I to thath

Double brilliant reversing Finder with Spirit

Long double extension best leather Bellows, with Lazy-tong supports to prevent sagging when using single extension. Rack and pinion focus-

sing, allowing back com-bination of lens to be finity Catch. Bushes for use on tripod. New pattern Spool Holders, simple, and very easily removed from camera. Two Spool Winders, allowing the spool to be

Automat Price as above Shutter. Fitted "Extra Rapid Aplanat" Lens, f/8

"Blitz Double Anastigmat" Lens, Series III., f/6.8

"Ross Homocentric," Series III., f/6.3 Lens
"Cooke Anastigmat," Series III., f/6.5 Lens 6 12 "Goerz Dagor" Double Anastigmat, f/6.8 Lens
"Zeiss Tessar," Series II., f/6.3 Lens
"Zeiss Double Protar," Series IV., f/6.3 Lens Extras. Focussing Screen with Hood Single Metal Dark Slides, each .. Leather Case Koilos Shutter, extra

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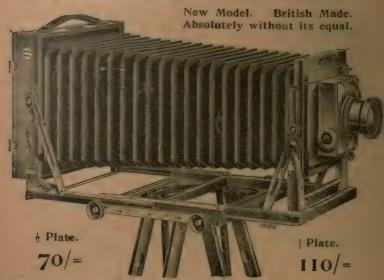
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Improved Triple "Diamond.



SPECIFICATION.

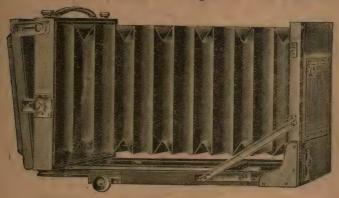
POLISHED Mahogany Camera, Triple Extension (21½ inches in half-plate size), actuated by two Racks and Pinions, and a movement for short focus lens, highly finished Brass Fittings. Automatic self-erecting Swing Front with extreme rising, falling, and cross movements (rigid in any position). Double Swing and Reversing Back, Real Leather Truncated Bellows, extra wide front, Plumb Indicator, flush Turntable, with clamp. Featherweight pattern Double Dark Slide of superior make, book-form. Thornton-Pickard Time and Instantaneous Behind Lens Shutter, with Speed Indicator. Three-fold Tripod Stand with Fittings for Turntable, Straps and Handle.

	-Plate.	-Plate.
T3144 - 3 44 02	£ s. d.	£ 8. d.
Fitted "Symmetrical 'Lens, F/8	3 10 0	5 10 0
Fitted "Busch" Rapid Symmetrical, F/8	3 15 0	5 17 6
Fitted "Blitz" Double Anastigmat, Series III., F/6.8	8 10 B	10 5 0
Extra Slides, each	8 6	14 6
Canvas Case	5 0	9 6
For Larger Size See Full	List.	

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PREMIER No. 4 "SQUARE FORM."



THE CAMERA FOR PROFESSIONALS.

This well-known pattern Camera will be found to meet every requirement of the advanced photographer, and is particularly suited for Architectural work. It has Double Extension Square Leather Bellows, giving great length of focus, Double Swing and Reversing Back and Rising and Crossing Front. Is made of best Figured Honduras Maliogany, and the Double Dark Slides have Spring Locks and Rabbeted Shutters.

Price	½-plate. £ s. d.	∤-plate. £ s. d.	10 × 8 £ s. d.	12 × 10 £ s. d.	15 × 12
With 3 Slides	3 15 0	4 45 6		a s. u.	£ s. d
	0 10 0	4 17 6	6 15 0	8 12 6	11 17 6
Extra Slides	7 2	11 10	40.0		11 1/ 0
Brass Binding		11 10	17 6	176	1 18 0
Diass Binding	1 5 0	1 7 6	1 10 0		
		. / 0	1 10 0	1 15 0	2 0 0

Premier set complete, consisting of Camera as above, Three Slides, "Blitz" double Anastigmat Lens, working aperture, f/6-8, Iris Diaphragm, Salex Time and Instantaneous Shutter, Threefold Ash Tripod.

	Size		½ plate	} plate	10 × 8	12 × 10
Price	 	•	£ s. d. 7 18 0	£ s. d. 10 16 0	£ s. d. 16 14 6	£ s. U, 20 13 0

SEND FOR DETAILED LIST OF APPARATUS SUITABLE FOR PROFESSIONAL USE.

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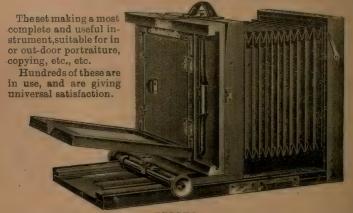
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15	×	12	19	60 in.	22		 		11 17	6
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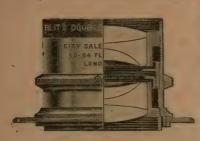
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	A OLIMON STREET		mend and and									
		Covering	PRICES.			In				focussing		
		medium				In Ke			oilos mo		oun	ıt,
		stop.					Shutter.			scaled.		
No. 1	1-plate	3-plate	4½ in. Focus	£	2 10	0	£4	5	0	£3	5	0
,, 2	5/4plate	} plate	6 in. Focus	:	2 17	6	4	15	0	3	12	6
,, 3	}-plate	10 × 8 plate	7 in. Focus	:	3 12	6	5	15	6		7	
,, 3A	8 × 5 plate	11 × 9 plate	81 in. Focus		4 15	0		-		5	10	0
,, 4 *	}-plate	12 x 10 plate	9g in. Focus	1	5 10	0		-		6	5	0
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3.1		5/4-plate	1-plate			5	5	0	7 13	0 6 0	0
3.2			10 × 8 plate			6	6	0	9 6		0
12	3A		11 × 9 plate				7	0	-		0
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			15×12 plate							_	
22	6	12×10 plat	e 16 × 11 plate	15 in. Focus		19	10	0		_	
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			£	S.	ā.	£	S.	d.
1-plate, with 51-in. Co.	ndenser		3	5	0	4	0	0
5 by 4, with $6\frac{1}{2}$ -in.	199	~."	4	0	0	5	0	0
$\frac{1}{2}$ -plate, with $8\frac{1}{2}$ -in.	* *		5	15	0	7	0	0
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and C-de-V	1		144	2/1	1/6	2 6	2,3	2.6	3/-	3/6
Lantern		34 x 34	72	1/10	1 2	2'2	1.9	2/2	2/4	2.6
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Quarter-Plate		4 x 3 }	36	1/1	11d.	1/6	1/3	1.4	1 6	1/8
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	2 x 8	$3\frac{1}{2}$ and 5×4	24	1/1	10d.	1/3	1/1	1/3	1/4	1/6
		99	72	2/8	2/2	3.5	2/11	3/6	3/8	3/10
		99	144	5/2	3/9	6/2	5/4	6/3	6/6	6/9
		51 x 4	24	1/2	10d.	1/4	1/2	1/4	1/5	1/7
		22	72	2 9	2/2	3/7	3/-	3/7	3/9	4:-
		77	144	5/3	3/10	6/8	5/5	6/6	6/8	7/6
		52 x 4	24	1/2	11d.	1/6	1/2	1/6	1/7	1/9
		27	72	2/10	2/4	3.9	3/1	3/8	4/2	4/8
· a . i		17	144	5/4	4/4	7,2	5/9	6/10	7/3	8:2
Cabinet	•••	6 x 4	24	1/3	11d.	1/7	1:4	1/7	1/8	1/10
		27	72 144	3/- 5/6	2/5 4/6	7:6	3/5 6/3	7/6	4/4	4 '9 8/6
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		10 x 8	6	1/2	11d.	1/4	1/2	1/4	1/6	1/8
		11	12	1/10	1/7	2/5	1/11	2/3	2/8	2/10
		12 x 10	100	12/6 1/8	$\frac{10}{6}$	$\frac{15/6}{2/2}$	13/6	14/6 2/-	15/6 2/3	17/6 2/6
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This Camera has been specially designed for serious Hand Camera workers, and is of the popular magazine type, up to date in every way. All the movements are positive in their action and cannot get out of order.

SPECIFICATION.

CAMERA.—Made of specially seasoned wood covered with hard Morocco leather cloth. Door at front for removing or altering lens or shutter. Door at back properly clamped and securely locked by means of a double-action spring lock at top and bottom. There is also a door in the bottom of Camera for the removal of exposed plates so that those unexposed are in no way interfered with. This door is fastened with a specially designed safety catch to prevent accidental opening. The interior of front door and lens board are polished mahogany. The Camera is fitted with a folding solid leather handle which is made to fold quite flat on Camera when not in use.

LENS,—Beck Rapid Symmetrical with Iris Diaphragms, working at f/8, of excellent quality and covering power.

SHUTTER.—Bausch and Lomb Unicum, working between lenses, giving Time exposures of any length, Bulb, and Instantaneous of 1, ½, 1-5th, 1-25th, 1-5oth and x-tooth of a second approximately, by finger or pneumatic release.

PLATE CHANGER.—Certain and positive in action. Cannot possibly fail or get out of order.

INDICATOR. - Correctly shows number of plates exposed.

FINDERS.—Best brilliant pattern showing image right way up.

FOCUSSING. - Rack and Pinion for all distances.

PRICE (complete with 12 Plate Sheaths) 32/6.

"A 'FAIR-FIELD' and no favour." The "FAIRFIELD" Cameras are Unexcelled.

THE "FAIRFIELD" PROFESSIONAL CAMERA.

Mr. W. J. OMAN, Engin-

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"It may interest you to know that I have used one of your Brass Bound Professional Cameras for over three years in West Africa. During the greater part of that time I have been travelling up country, and the only protection which the instrument has received from the tropical sun and rain has been that afforded by a limp waterproof case. The camera has been unaffected by the trying climate and is still in excellent condition."



Extreme rise and Fall to Sliding Front. Brass-bound Throughout. Every Modern Improvement.

SPECIFICATION.

CAMERA.—Strongly made of Solid Polished Mahogany, Brass-bound all over. Front specially construced to take large heavy lenses, and exceptionally rigid. Best quality Square Leather Bellows, specially made to withstand hard wear. Double Swing Back. Long Extension with Rack and rinion. Rising, Falling, and Cross Fronts, each Camera being fitted with a movable interior panel, allowing an extreme rise and fall to the front, which in the Whole Plate size amounts to a 3 in. rise and 3 in. fall. The whole is excellently finished in every detail.

DARK SLIDES -Three to each Camera; Brass-bound Double Book-form, with many modern improvements, ensuring absolute safety from light and freedom from splitting in any way; Double Rebated Shutt-rs with Spring Catches, Side Clips, Hinged Spring Divisions keeping plates in absolute register and numbered.

PRICE, with 3 Brass-bound Slides:

$6\frac{1}{2} \times 4\frac{3}{4}$ $8\frac{1}{2} \times 6\frac{1}{2}$	• • •	• • •	£5	5	0	12×10	•••	 29	9	0
$8\frac{1}{2} \times 6\frac{1}{2}$	•••	• • • •	6	6	0	15×12		 13	13	0
10×8		•••	7	7	0					

The 15×12 Camera can be fitted with a separate Repeating Back, allowing two or more pictures to be taken on one plate. This Repeating Back is fitted with hinged focussing screen and dark slide inserted from side.

Price of Adapter and One Whole-plate Studio Sl'de, £3 10s.

Any make of Lens fitted to order at Maker's List Price.

"A 'FAIR-FIELD' and no favour." The "FAIRFIELD" Cameras are Unexcelled.

THE "FAIRFIELD" PROFESSIONAL CAMERA—(Continued).

COMPLETE SPECIALITY OUTFITS.

Half-Plate Complete Outfit.

Camera.—Half-Plate Brass-bound "Fairfield" Professional (as specification).

Lens.—Busch No. 2 Rapid Aplanat F/8, with Iris Diaphragms,

8 in. focus, embracing an angle of 75°.

Shutter.—"Fairfield" Roller-blind Time and Instantaneous, with speed indicator giving exposures from 1-15th to 1-90th of a second and time at will, by pneumatic release.

Slides.—Three Brass-bound (as specification).

Tripod.—Three-fold Rule-joint Sliding-leg, with Tripod head, and leather straps. Strong, compact, rigid.

£6 Os. Od.

Whole Plate Complete Outfit.

Camera.—Whole Plate Brass-bound "Fairfield" Professional (as specification).

Lens.—Busch No. 3 Rapid Aplanat F/8, with Iris Diaphragms,

10 in. focus, embracing an angle of 75°.

Shutter.—"Fairfield" Roller-blind Time and Instantaneous, with speed indicator giving exposures from 1-15th to 1-90th of a second and time at will, by pneumatic release.

Slides.—Three Brass-bound (as specification).

Tripod.—Three-fold Rule-joint Sliding-leg, with Tripod head, and leather straps. Strong, compact, rigid.

£7 15s. Od.

12 × 10 Complete Outfit.

Camera.—12×10 Brass-bound "Fairfield" Professional (as specification).

Lens.—Best quality Rapid Aplanat F/8, with Iris Diaphragms.

Shutter.—"Fairfield" Roller-blind Time and Instantaneous, before or behind lens pattern, with speed indicator giving exposures from 1.15th to 1.50th of a second and time at will, by pneumatic release.

Slides.—Three Brass-bound (as specification).

Tripod. - Extra heavy Three-fold Rule-joint Sliding-leg, with 10 in. Tripod head, and leather straps. Very strong and rigid.

£12 Os. Od.

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Why pay 70/- for a Triple Extension Half-plate Outfit when you can get it for SIXTY SHILLINGS.

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EQUAL TO ANY 70/-OUTFIT.

SPECIFICATION.

CAMERA,—Made of thoroughly seasoned polished Mahogany throughout. Rising, falling, cross, and double swing Front. Double swing, reversing, and wide-angle Back. Side swing, Triple extension by Rack and Pinion both Front and Back; extension thus equally balanced secures complete absence of vibration. Guaranteed Best Leather Bellows, with truncated corners to prevent sagging, length of extension 22 inches. Closes to 2½ inches. Rise of Front 3½ inches. Turntable in baseboard. Weight 3½ lbs.

DARK SLIDE.—One best quality double book-form, with side clips, spring catches, double rebated draw shutters, spring division between plates, numbers, and bayonet fitting.

LENS.—Beck Rapid Symmetrical, with Iris Diaphragm, working at f/8.

SHUT!ER .- Thornton Pickard Behind-lens Roller-blind Time and Instantaneous. with speed indicator giving exposures from 1-15th to 1-90th of a second and time at will, by pneumatic release, and removable panel.

TRIPOD.—Rule-joint 3-fold polished Ash, fitted with sliding leg, stretchers. leather straps, etc., very firm and rigid.

If you wish to pay 70/- we will oblige you and give you this Outfit with TWO EXTRA DOUBLE DARK SLIDES AND STIFF WATERPROOF CAMERA CASE. ALL INCLUDED, 70/-

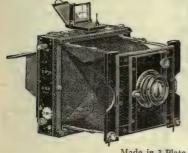
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One Movement only sets everything!





Made in 1-Plate Size only.

Fitted with Wünsche's Patent Self-Capping Shutter.

THE ACME OF SIMPLICITY.

This Camera has been designed on quite a new principle, the most important feature being its completeness in itself, every movement being entirely under the innmediate control of the operator. It has been carefully designed to produce an instrument of precision which can be relied upon to do its duty at the most critical moment with an exactitude which cannot be equalled by any other existing Camera.

SPECIFICATION.

CAMERA, - Made of thoroughly seasoned wood, covered wherever possible with fine Morocco leather, Morocco leather folding bellows which pull out and lock automatically and rigidly by expanding metal arms. Fitted with rising, falling, and cross fronts. Sliding struts on front fixed by thumb screws to allow of it standing by itself to give prolonged time exposures.

SHUTTER. This is its most important feature. It is capable of giving exposures from 1/34th to 1/1100th part of a second and time at will, the whole of the operation of setting being performed from outside, and the opening of the blind being obtained by winding the setting handle until the opening required appears on the dial. It is fitted with finger and pneumatic release. When setting, no light passes through the

shutter, and the speed adjustment is made after shutter is set.

FINDER.—Detachable. It is of the brilliant concave pattern for direct vision, but is fitted with a sliding mirror which at once converts it into ordinary reflecting type.

FOCUSSING SCREEN.—Fitted with spring Focussing Hood so that focussing can

be performed in any light, entirely dispensing with focussing cloth.

DARK SLIDES.—Best quality double book form with spring plate division. Side
Clips, Shutters made of Aluminium. Pull out pattern fitted with spring catches.

Price for Plates, 41 by 31.

Complete with three double dark slides		15	
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Best quality Solid Leather Case to hold complete set	 0	13	0

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Dr. Shraner's Ex. Rapid Aplanat in Reicka Shutter Do. in Wunsche Reicka Automat or Bausch	66/- In Com- pound	-	-	_	Single Exten- sion only 57/-	_	-
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Shutter Wunsche Afpi Anastig-	91/~	101/-	106/~	_	_	112/-	123/-
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Reicka Automat Shutter Zeiss Tessar IIB in B and L or Wunsche	178/-	183/-	211/-	310/-		187/-	232/-
Reicka Automat Shutter	-	_	195/-	In Com-	-	182/6	207/-
Zeiss Double Protar, Series IV., in B and Lor Wunsche Reicka Automat Shutter	_	_		pound Shutter only 354/-		217/-	252/
Reicka Envelopes for plates or films	4/-	5/-	6/-	7/-	4/-	5/-	6/-
Reicka Adapter with	dozen	dozen	dozen	dozen	dozen	dozen	dozen
focussing screen Single Metal Slides	13/6	16/-	16/-	20/-	13/6	16/-	16/-
Double Metal Slides	-1/0	2/6	1/3	_	1/0		- 1/3
Metal Film Pack	AIR		01		AIC	AIC	0/
Adapters Double Wood Slides	4/6	4/6	6/-	12/-	4/6	4/6	6/-
Solid Leather Case	6/6	9/-	9/-	15/-	4/9	5/6	7/6
			1				

Extra Cost for Compound Sector or Koilos Shutter, in place of those listed, 17/The COMPOUND SECTOR SHUTTER is recommended on account of its neatness and the
reliability of its marked speeds.

All Plate Cameras are supplied either with Double Plate Holders or Single Plate Holders in case, according to its construction.

SPECIAL NOTE.—The 3½ ×2½ and 5½ ×3½ Film Cameras take 3½ ×2½ and 5½ ×3½ plates.

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WÜNSCHE'S PATENT "SPEEDY" FOCAL PLANE CAMERA.

A Combined Film & Glass Plate Folding Camera, for $3\frac{1}{4} \times 4\frac{1}{4}$ Plates or Films.

The only Camera of its kind fitted with Focal Plane Shutter.



SPECIFICATION.

CAMERA.—Measures 9½ × 4½ × 2½. It is splendidly made of well seasoned wood, polished mahogany, and aluminium metal. The front falls down and locks automatically, forming baseboard. Front of Camera pulls out and locks automatically at fixed focus by means of a novel set stop which can be set for plates or films or left open to use the back combination of lens by means of the double extension of baseboard of Camera. It is fitted with a rack and pinion rising and falling front which locks rigidly. Also cross front by means of an endless screw on either side. Best leather long extension bellows. Double extension baseboard actuated by a locking rack and pinion. The baseboardis fitted with two scales, one for use with the lens at single extension and the other for using back combination of lens only. The body of Camera is made to take Roll Films in the ordinary daylight loading cartridges; or by attaching springhooded focusing glass can be made to take Plates in double dark slides. Fitted with solid leather

carrying handle, standing strut to baseboard, and two screw holes for upright and horizontal pictures with tripod.

SHUTTER.—This is Wünsche's Patent Self-Capping Shutter of the most improved type, giving exposures from 1-28th to 1-2200 part of a second and time exposures at will. The whole operation of etting the shutter and adjusting the opening of the slit is performed in one moment only outside the Camera, this adjustment being obtained by winding the setting knob until the opening required is seen on the dial provided.

FINDER.—Of the brilliant direct vision pattern with the pointer on the front of Camera, so situated that the Camera can be used in any position to adjust the motion of shutter to moving objects.

PLATE HOLDERS.—Made of metal with pull-out shutters. They are double, each slide holding two plates.

HOOD.—A Focussing Screen with Spring Hood is provided for use with plates.

FILM CHAMBERS.—These are fitted with patent spring clips which hold the film firmly in position round the spool and eject the used spool from camera when released.

Camera, Three Double Dark Slides, and Focussing Hood in Envelope (complete as Specification), without Lens, £4 4s. 0d.

The following suitable LENSES can be fitted to this Camera at Makers' List Price, as under, but are obtained to order only—

Beck Isostigmar, Series II., No. 3, f/5'8		£ 2 12 6
Busch Detective Aplanat, Series A, No. 2, f/6		4 15 0
Busch Detective Aplanat, Series A, No. 2, 1/6		1 10 0
Cooke, Series III., f/6'5 (with Patent Flange, 2/- ext	ra)	4 0 0
Goerz Syntor, No. o, 1/6.8		3 5 0
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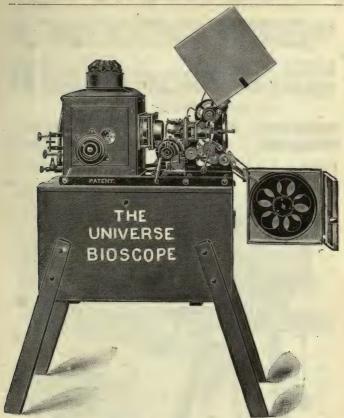


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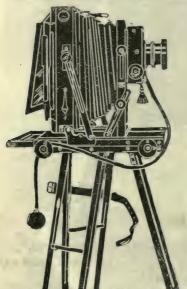
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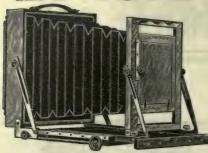
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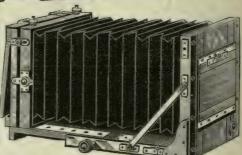


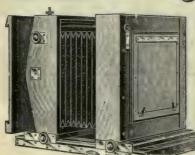
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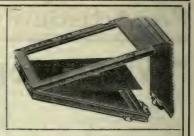
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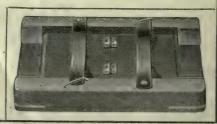
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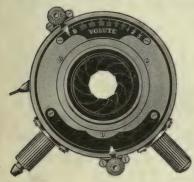


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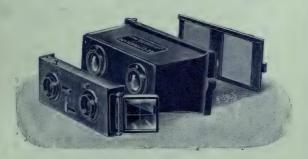
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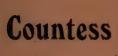


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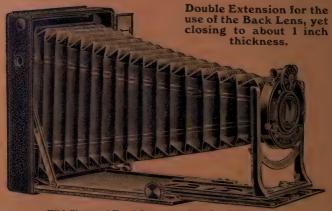
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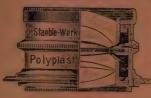
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The back lens when used alone is a

properly corrected anastigmat of about double the focal length of the complete lens. The longer foci, of apertures from f/7-7to f/12-5, are specially corrected for process reproduction, three-colour photography, photo-zinco, and half-tone work.

Equivaln't Focus.	Aperture.	Plate sharply covered at full aperture.	In Ordinary or Sunk Mount, with Iris Diaphragm.		With Compound or Koilos Shutter.
Inches. *41 *55 *65 *75 *105	F/ 5·9 6·0 6·3 6·3 6·8	Inches. 3½ × 2½ 4½ × 3½ 5½ × 3½ 6½ × 4½ 8½ × 6½	£ s. d. 4 5 0 4 15 0 5 10 0 8 5 0 9 15 0	£ 8. d. 5 2 0 5 15 0 6 15 0 7 15 0 11 10 0	£ s. d. 6 0 0 6 10 0 7 10 0 8 10 0 12 10 0

* Supplied in the Rapid Attachment these foci may be completed by the "Combination Lenses" to the Polyplast Set.

The cost of pairing two lenses for stereoscopic work is 6s.

Also made in focal lengths of 2\frac{3}{2} ins. to 36 ins.

RAPID ATTACHMENT.—The lenses of foci, 23 to 103 inches, in Ordinary or Sunk Mounts and Diaphragm Shutters, can be supplied in Rapid Attachment, in which latter case the price is about 10/- more. The Rapid Attachment has the advantage that when using the back lens only the front lens is removed in an instant, and discloses the diaphragm scale of the back lens.

THE POLYPLAST SET supplies five different combinations, all of which are excellent anastigmat lenses, the apertures and foci of which are given in the table below. Combination No. II. is formed from the complete double anastigmat, Polyplast, No. V. by the (anastigmatically corrected) back lens, No. I (wide angle) Nos. III. and IV. by the Combination Lenses.

101 196	Comb. No.	, I.	II.	III.	IV.	V.
Plate, Inches.	Aperture.	F/16.	F/5.9 to F/6.8.	F/8.	F/11.	F/16.
$ \begin{array}{r} 3\frac{1}{2} \times 2\frac{1}{2} \\ 4\frac{1}{4} \times 3\frac{1}{4} \\ 5\frac{1}{2} \times 3\frac{1}{2} \end{array} $	f= f= f=	31 41 5	4 <u>1</u> 5 <u>1</u> 6 1	5½ 6½ 8½	6 8 9k	7 9 11
$6\frac{1}{8} \times 4\frac{3}{4}$ $8\frac{1}{2} \times 6\frac{3}{4}$	f = f =	6	7 ² / ₄ 10 ¹ / ₂	9½ 13	111	13

SHERWOOD & SELDT, 15, Mount Pleasant, LONDON, E.G. English Agents.

Dr. STAEBLE-WERK, G. m. Optical Co. MUNICH. Bayaria.

COMBINATION LENSES.

For Polyplast, in Ordinary and Sunk Mounts, and for Diaphragm Shutters.



Size of Plate (inches),	Complete with 3 Comb. Lenses 3 Yellow Screens all in oase.	Combination Lenses, each	Extra for Schott Yellow Screens, each
3½ × 2½ 4¼ × 3¼ 5½ × 4¾ 8½ × 6½	£ s. d. 3 10 0 3 15 0 4 5 0 4 15 0 7 10 0	£ s. d. 1 3 0 1 4 0 1 7 0 1 10 0 2 8 0	£ s. d. 0 9 0 0 9 0 0 11 0 0 11 0 0 15 0

ADVANTAGES OF THE 'POLYPLAST SET.'

 Rapid Attachment. The single combination can be brought into use in the most rapid manner.

2.—The Back Lens is a fixture in the Mount, only the Front Lens is removed, so that the change of the Combination Lenses is made from the front of the camera without removing the lens, and even while the plate is in position for exposure.

3.—Automatic indication of focal length and aperture.

There are two separate scales of apertures marked, one for the back combination, and the other for each Combination Lens. That for the back lens is on the main barrel of the mount. When the front lens is in position, only the graduation for the whole lens can be read, that for the back lens being covered by the cell of the front lens.





Ordinary Mounting of the 'Polyplast Set,' with Rapid Attachment.

The markings of the stops corresponing with the complete lens, and the back combination are visible only when one or the other are adjusted for use.

'Polyplast Set' mounted in Diaphragm Shutters, with Rapid Attachment. The detachable front lens carries a scale of apertures corresponding with the complete instrument. On removal of the front lens, the apertures corresponding to the back lens, used alone, appear under the shutter.

Dr. STAEBLE-WERK, 6. m. Optical Co. MUNICH. Bavaria.



Double-Anastigmat CHOROPLAST.

Series | F/3'9.

A lens of special design and of the very largest aperture for instantaneous portraiture of figures and groups in the studio. Specially suited for the most rapid exposures of sporting subjects, etc., for cinematography, stellar photography and projection.

Equivaln't Focus.	Aperture	Plate sharply covered at full aperture.	In Ordinary or Sunk Mount, with Iris Diaphragm.	In Focussing Mount, with Iris Diaphragm.	With Compound or Koilos Shutter.
Inches. 43 6 71 81 10	F/ 3·9 3·9 3·9 3·9 3·9	Inches. 34 × 24 44 × 34 54 × 34 54 × 34 64 × 44 84 × 62	£ s. d. 5 0 0 6 15 0 8 5 0 11 10 0 15 0 0	£ s. d. 5 0 0 8 0 0 9 10 0 15 0 0 16 10 0	£ s. d. 7 0 0 9 0 0 11 0 0

Also made in focal lengths of 14½ ins. to 19 ins. The cost of pairing two lenses for stereoscopic work is 6s.

Double-Anastigmat CHOROPLAST.

The CHOROPLAST t/5-5 is suitable for all descriptions of instantaneous photography and, as a result of its lesser aperture in comparison with the f/3-9 CHORO-PLAST, possesses greater depth, is a smaller lens, and is sold at a lower price.

41	5.5	$3\frac{1}{2} \times 2\frac{1}{2}$	3 0	0	4 0 0	4 15 0
5½ 6½	5·5 5·5	4½ × 3½ 5½ × 3½	3 10 4 10	0	4 15 0 6 0 0	5 5 0 6 10 0
8 10 ³ / ₄	5·5 5·9	61×41 9×7	6 5	0	8 0 0	8 10 0 10 15 0

Also made in focal lengths of 12\frac{3}{4} ins. to 19 ins.

The cost of pairing two lenses for stereoscopic work is 6s.

Double-Anastigmat CHOROPLAST.

Series III F/6'3.

A 4-lens double anastigmat of moderate price for all photographic purposes. The back lens may be used as a single landscape lens of approximately double the

Car rengu	14.				
31	6.3	31×21	2 14 0	3 10 0	4 9 0
44	6.3	$4\frac{3}{4} \times 3\frac{3}{4}$	2 17 0	3 15 0	- 4 12 0
6	6.3	$5\frac{1}{8} \times 3\frac{1}{8}$	3 6 0	4 8 0	5 1 0
71	6.3	65×4±	4 0 0	5 5 0	6 0 0
94	6.8	8½×6½.	6 5 0	8 0 0	8 10 0

Also made in focal lengths of 11 ins. to 17 ins. The cost of pairing two lenses for stereoscopic work is 6s.

English Agents. SHERWOOD & SELDT, 15, Mount Pleasant, LONDON, E.C.

Dr. STAEBLE-WERK, 6. m.

Optical Co. MUNICH. Bavaria.

WIDE-ANGLE ANASTIGMAT LINEOPLAST, F/12:5.



Max, angle of view, 110 deg.

An Anastigmat of large aperture for panoram pictures, for indoor and outdoor architectural photography, photo surveying, and all classes of process reproduction and copying. Its comparatively large aperture allows of the "Lineoplast" being used for your large proportion of interacts. a very large proportion of instantaneous

Equivalent Focus.	1	Plate su	In Ordinary Mount	
	Aperture.	For at Full Aperture.	For Small Stons.	with Iris Diaphragm.
Inches. 2½ 3½ 5½ 7½	F/ 12·5 12·5 12·5 12·5	Inches. 3\frac{1}{2} \times 2\frac{1}{2} 4\frac{1}{2} \times 3\frac{1}{2} 6\frac{1}{2} \times 4\frac{1}{2} 8\frac{1}{2} \times 6\frac{1}{2}	Inches. 5½ × 3½ 7 × 5 10 × 8 12 × 10	£ s. d. 3 5 0 3 10 0 4 0 0 5 0 0

Also made in focal lengths of 101 ins. to 40 ins.

UNIVERSAL-APLAN



A high-class lens for instantaneous and general photography at moderate price. Suitable for portraits, groups, and landscape work, also for indoor and outdoor architectural photo-graphy. With a medium stop the results given by this lens are equal to those given by any anastigmat.

A special advantage of the "Monoplast" Universal Aplanat is the extreme width of angle over which the lens covers when used with wide-angle lens. The back lens may be used as a single landscape objective of a medium stop. about double the focus.

10 1 15	ire,	Plate su	ilt ible.	In Ordinary or	In Focussing	With	With Ibso Shutter,	
Equi len Focu	Aperti	For at Full Apertures.	For Small Stops,	Sunk Mount, with Iris Diaphragm.		Compound or Koilos Shutter,		
Ins.	F/_	Inches.	Inches.	£ s. d.	£ 8. d.	£ s. d.	£ 8, d.	
44	7.7	$3\frac{1}{2} \times 2\frac{1}{2}$	6½×4¾	1 7 0	2 0 0	3 0 0	2 10 0	
6	7.7	4½×3½	$8\frac{1}{2} \times 6\frac{1}{2}$	1 10 0	2 5 0	3 5 0	2 15 0	
71/2	7.7	5½×3½	10×8	1 13 0	2 10 0	3 15 0		
83	7.7	6½×4¾	12×10	1 16 0	2 15 0	4 5 0		
12	7.7	$8\frac{1}{2} \times 6\frac{1}{2}$	15×12	2 10 0				

Also made in focal lengths of 17 ins. and 21; ins. The cost of pairing two lenses for stereoscopic work is 6s.

PORTRAIT LENSES F/3.2.

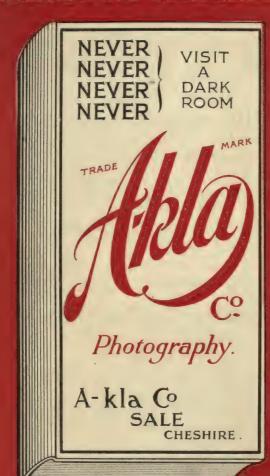
Double Anastigmat Protoplast F/6.8.

TELEPHOTO MEGAPLAST. Reversing Prims. Focussing Eye-Pieces. Orthochromatic Light Filters.

English SHERWOOD & SELDT, Agents.

15, Mount Pleasant, LONDON, E.C.

GLASS PLATES DAYLIGHT LOADING



DAYLIGHT UNLOADING

DAYLIGHT DEVELOPING GLASS PLATES

"A-KLA" PHOTOGRAPHY

WHAT IS IT?

An entirely new system of Glass Plate Photography, by means of which Glass Photographic Plates can be Loaded, Unloaded, and Developed in DAYLIGHT.

THE "A-KLA" SYSTEM

abolishes all Dark Rooms or substitutes for same (such as Changing Bags, Changing Boxes, etc.), from its realm, at the same time retaining all the simplicity, certainty, and control in development as in the old style of Dark Room and Dark Slide Photography.

THE "A-KLA" SYSTEM

of Daylight Developing being by Sight and not by Formula, a developer of unknown strength may be used with equally good results.

THE "A-KLA" OUTFIT consists

- 1. A Pair of "A-KLA" Slides, with no mechanism to go wrong.
- 2. Glass Photographic Plates of the highest possible quality, for use with the "A-kla" Slides; also small sensitized pieces of material known as "Developettes," which determine the length of time needed for development.
- 3. Two small Vulcanite Cases for developing the Plates.

NOTE.—The "A-kla" Plates are loaded into the Developing Tanks in DAYLIGHT.

OF ALL DEALERS

"A-KLA" PHOTOGRAPHY



Pair of Plates.

A Pair of "A·KLA"
Plates are taken
from the box and
placed at the exposure
opening of the "A-KLA"
Slide, after which the
usual shutters are inserted in front.

This being done, the slide is now placed in the camera, and the plates exposed in the ordinary way.

The slide is now taken from the camera and the plates removed, when they will be ready for development.

In development, the plates are placed in small vulcanite cases made to fit them, and then immersed in the developer

together with a developette, the latter acting as a guide in the operation.

When it is found that the developette has developed to the satisfaction of the operator, the developer is poured off, and the fixer poured on in its place, the developette again acting as guide.

This process completed, the negatives are ready for washing, which is carried out in the customary way.

NOTE.—It must here be particularly pointed out that the whole process is carried on under any condition of light. In that of the most brilliant if necessary.



Developing.

"A-KLA" PHOTOGRAPHY



Loading of Slide.

NOTES.

No special camera is required, the "A-KLA" slides being used in conjunction with any of the usual type of bellows or box cameras employing dark slides, and each or any picture may be focussed upon the screen in the usual way.

No mechanism whatever to go wrong.

The plates are not stained or dyed in any way either by us or those using them.

Any developer can be used of any desired strength.

The development being by sight and not by formula, a developer of unknown strength may be used with equally as good result.

Quantity of developer or fixer required, 6-ozs.

The process of development can be carried out in 3 minutes.

The "A-KLA" Slides are sold independently of the developing Outht, so that if desired the latter portion may be dispensed with and the A-kla plates developed in the dark room by the ordinary methods.

PRICES (1-plate size).

of "A-kla" Slides and Two developing Tanks 20/-

As the Outfit can be purchased in parts A pair of Slides may be had for.. 15/-

"A-kla" Plates, backed and ready for use (including developettes), per doz. 1/3

FOR OTHER SIZES, &c.,

WRITE FOR PARTICILLARS

New Superb Backgrounds.

. For Sizes and Prices of Scenic Packgrounds, see pages 1164-65.



Our A.R.C. ENGLISH BACKGROUNDS are absolutely THE BEST.

For many years we have made it our study to produce Backgrounds that are superior in every way to many that are offered at much higher prices. Our principal artist has spent his whole life at this class of work.

BUY THE OLD COUNTRY'S PRODUCTIONS,

and you will have secured the best it is possible to buy, and at reasonable prices Here are a few specimen designs, others may be had on application. Much of the beauty in detail and soft tone is lost in reproduction, not with standing we have had high-class half-time blocks made. With the originals, however, we guarantee you will be absolutely satisfied.

Designs can be altered or painted altogether from customers' own ideas or sketch at the same prices. It is advisable when ordering to state whether light, medium or dark tints are required, and also if the lighting falls on the sitter's right or left.

The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM.

New Superb Backgrounds.



CANVAS BACKGROUNDS.

Painted in Flatted Oils, on Rollers complete for hanging-

8 feet ×8 feet			2 2 0	
8 ,, ×7 ,, 8 ,, ×6 ,,	••	• •	~ 0 0	WILLISIX EXITS test continued to
Canvas	Backgro	ounds.	with one	ground. Price, 12/6 extra.

Canvas Backgrounds, with one side black and the other side white, quite plain; supplied in the above or any other sizes. 8ft, x 8ft, size. £1 10 0; or may be had all black and all white at same prices.

Backgrounds of Clouds only—no straight lines—light medium, or dark, painted on the same sizes of canvas as above, 2s. Od. each less, Backgrounds in distemper instead of Flatted Oils, 48. Od, each less.

We can also supply a **cheap quality Canvas Background**, painted in distemper, size 8ft. x 6ft. for £1 1 0. Suitable for medium class of trade; often sold elsewhere at 30/-.

Price List continued on next page.

The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM.

New Superb Backgrounds.



PRICE LIST-continued.

	GROUP					CLOUDS	GRA	DUAT	red.	
14 fee	t × 8 feet	 £3	5 0	8	feet	× 6 feet			£0 18	0
12 ,,	× 8 ;,	 3	0 0	6	>1	× 5 "			0 14	6
10 ,,	× 8 ,,	 2	12 6	5	25	× 4 ,,			0 10	6

PAPER BACKGROUNDS.

Canvas Bound, and on Roller complete, Painted in Distemper,

13	feet	×	7 feet	+		6/6	With continuous	Foreground
5	17	X	8 ,,		 	 8/3	2/6	extra.

Other sizes painted specially to order, either on Canvas or Paper, and in Flatted Oils or Distemper. OLD BACKGROUNDS REPAINTED.

Door Panel Paintings in Oil or Water Colours, large size 8 to 9 inches wide and 36 inches deep, £3 3 0; smaller sizes £1 11 6. Suitable for any Drawing Room.

The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM.

New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see pages 1164-65.





TITLE PRINTING OUTFITS

comprising Box with Ink Pad, Type Holder, Tweezers, Letters, Figures, Spaces.

	 s.	d.	
Small Set, 90 Letters, etc.	 1	6	
Medium ,, 150 ,, ,,	 2	9	
Full 360	 5	0	

New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see page 1164-65.



REPAIR DEPARTMENT.

We undertake repairs of all kinds to Photographic and other Apparatus.

CAMERAS, SLIDES, SHUTTERS, STANDS

and other Articles Repaired on the shortest notice and at reasonable prices.

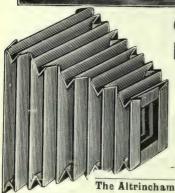
Slides matched and other Apparatus made specially to order.

The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM.

New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see pages 1164-65.





Camera Bellows.

IN ALL SHADES. IN ANY SIZE. IN ALL QUALITIES.

When ordering please give outside dimensions of Back and also of Front and the length of extension. Also specify which is Bottom side of Bellows.

Hand Cameras covered in Real and Imitation Leathers at the shortest notice,

Best Workmanship Guaranteed.

The Altrincham Rubber Co., Mossburn Buildings, Altrincham.

THE ALTRINCHAM RUBBER CO.'S NEW SUPERB BACKGROUNDS.



Sft. GROUP GROUND. For Prices see page 1165.

ILLUSTRATION OF 14ft, X 8ft, GROUP GROUND.

The other designs shown in this list also make effective group backgrounds.

New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see pages 1164-65.



A ITATHER RIVET LINED

LENS CASE	ES.		
Best Sole Leather Lens Cases. velvet lined, with straps and		1/2-pl.	ı/ıpl
superior leather covered buckle. each	2/9	3/-	3/9
with solid bottom to prevent injury to Lens (bag shape) ea.	94.	1/-	1/3
Morocco Leather Covered Round Lens Cases with pull-off lids each			
Morocco Leather Covered	3/-	3/3	4/-
lined, with rounded hinged lid each	3/-	3/3	4/-

Intermediate and larger sizes made at proportionately reasonable prices.

WHEN ORDERING a Special Case please always state—ist. The length, that is across the front from top to bottom.

New Superb Backgrounds.

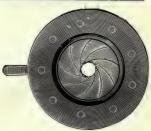


IRIS DIAPHRAGMS.

Full					
Aperture.		Aperture.			
½ in	1/9 each.	Il in.		3/3 each.	
‡ ,,	2/- ,,	11,,		3/6 ,, -	
3 ,,	2/3 ,,	I 3 ,,		3/9 ,,	
7 ,,	2/6 ,,	2 ,,		4/- ,,	
I ,,	2/9 ,,	24 ,,	*****	8/- ,,	
18 ,,	3/- ,,	27 ,,		5/6 ,,	

IRIS DIAPHRAGMS FITTED

to Cus	stomer	s Ler	ises in	grave	d with	1 1	NOS.
1-plate						6/6	each
1/I ,,						9/6	22
I/I ,,					1	2/6	11



The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM,

THE ALTRINCHAM RUBBER COMPANY'S New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see pages 1164-65.



PERFECT FLAT SQUEEGEE. THE



Better than a Roller Squeegee. Ensures Perfect Contact. No defective patches in the Print. ORDINARY AMATEUR SIZE.

These are the best that can be procured at the price. They are made with good strong polished mahogany handle and rubber poissing managery mande and rubber tongue, and are suitable in every respect for ordinary amateur use. They are far more effective than the more bulky pattern of Roller Squeegees. They produce perfect contact, and prevent air bubbles.

Sizes 10 Prices 12 5d. 6d. 8d. 9d. 10d. 1/- 1/2 1/3 1/6 each.

PROFESSIONAL SIZE. For every-day Professional Work we have prepared a much stronger article, which cannot be surpassed, and is suitable for the heaviest work. The woodwork, rubber, and general finish of this is first class in every respect. Prices—6-in. 1/6; 8-in. 2/0; 9-in. 2/4; 10-in. 2/6; r2-in, 3/- each.

The Altrincham Rubber Co., Mossburn Buildings, Altrincham.

New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see pages 1164-65



FOCUSSING CLOTHS EACH ONE NEATLY BOXED.

Black Twill, closely woven, not lined, for Studio use, light in weight, $30 \text{ in.} \times 30 \text{ in.} \times 1/2$; $30 \text{ in.} \times 36 \text{ in.} \times 1/3$; $42 \text{ in.} \times 40 \text{ in.} \times 1/9$

Black Velvet, lined with very superior quality Ruby Sateen.
Size, 36 in. x30 in., 4/6; 45 in. x40 in., 7/6; 60 in. x40 in., 10/6
Any other sizes, intermediate or larger, made to order.

The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM.

THE ALTRINCHAM RUBBER COMPANY'S New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see pages 1164-65.



A TEM T PRINT WASTING HOS

Washing Rose And FILTER For NEGATIVES & PRINTS. Fits Round or Oval Taps. Price

Filters the water at same time. Prevents Splashing.

The Rose will unscrew, and the Filter 1/6 can be used separately for domestic purposes.

Or with Extension Piece (5in.) of Tubing, so that the Rose can be 1/9 moved to any part of the dish.

Or with one yard of Tubing. 2/9

The Altrincham Rubber Co., Mossburn Buildings, Altrincham.

THE ALTRINOUAN BURBER COMPANY

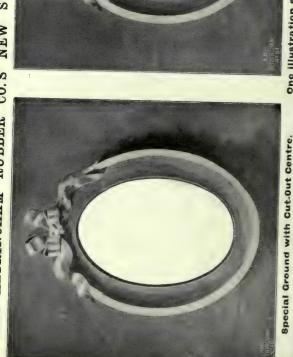
New Superb Backgrounds.

For Sizes and Prices of Scenic Backgrounds, see pages 1164-65.





SUPERB BACKGROUNDS. THE ALTRINCHAM RUBBER CO.'S NEW





One illustration shows the idea, the other the effect. Painted on Canvas in Flatted Olls in best style, size 5ft. x 7ft., price £1 5 0; or in Distemper at £1 2 0. Circles, Squares, Oblong and Hexagonal Shapes produced in similar style, also are very effective. Prices the same,

The Altrincham Rubber Co., Photographic Specialists and Background Painters. Mossburn Buildings, Altrincham.

New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see pages 1164-65



LENS CAPS.



Best
MOROCCO
LEATHER
COVERED
CAPS for
JANGEO

	10 nt					
	ens Hoo					
	up to	Q	uality	y. Q	uality	7.
Ιģ	inches,	each	6 d.		5 d.	
2 }	,,	23	9 d.		8 d.	
3	11	11	1/2		1/-	
31	99	99	1/9		1/6	
11			2/9		2/6	

YELLOW GLASS CAPS

- FOR -

ENLARGING LENSES.

Intermediate and larger sizes to order.

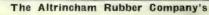
To fit on Hood or Tube of Lens.

		IVIAU	G 111	rue tor	IOW.	1118 512	.65		
				each.	28	inch.		2/8	each.
						9.9			
	11				2 5			3/-	,,,
	11		2/2		34			3/2	19
	2.1		2/4		2 7	23		3/4	
21	11		2/6		3	77		3/6	
	May	also	be 1	nad in	Rul	by Co	loured	1 Gla	SS.

THE ALTRINCHAM RUBBER COMPANY'S New Superb Backgrounds.

For Sizes and Prices of Scenic Backgrounds, see pages 1164-65.



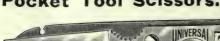


Pocket Tool Scissors.

POCKET TOOL SCISSORS

> 18 DIFFEREN

> > TOOLS



PRICE ONLY OIR A High-Class, good looking Article ONLY OIR Can be carried in the waistcoat pocket. Useful for Everybody. Weight, including Case only 12 ozs.

SCISSORS BUTTON HOLE SCISSORS

GASPIPE TONGS CIGAR CUTTER

WIRE CUTTER RULER

MEASURE 8 NAIL FILE

SCREW DRIVER 9 CIGAR BOX OPENER 10

11 CARTRIDGE EXTRACTOR 12 HAMMER

PENKNIFE 13

14 GLASS CUTTER 15

GLASS BREAKER 16 MARKING WHEEL

17 ERASING KNIFE 18 STEREOSCOPE



The Altrincham Rubber Company's New Superb

BOAT PROFILE

Built of Wood, Canvas covered, painted in flatted oils; 7ft. long by 2ft.

A Cloud Background may be used in conjunction with the River Boat

A Cloud Background may be used in conjunction with the River Boat

New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see page 1164-65.



RUBBER SUNDRIES.

PRINTING FRAME PADS OF DOUBLE PROOFED RUBBER CLOTH.

 $4\frac{1}{4}$ ins. \times $3\frac{1}{4}$ ins. at **8d**. per doz, 5 ins. \times 4 ins at **1**/- , 10 ins. \times 8 ins. at **4**/6 , 11 ins. \times 4 $\frac{3}{4}$ ins. at **1**/6 , 12 ins. \times 10 ins. at **5**/6 , 15 ins. \times 5 ins. at **2**/- , 15 ins. \times 12 ins. at **8**/6 , 15 ins. \times 12 ins. at **8**/6 , 15 ins. \times 12 ins. at **8**/6 , 15 ins. at **8**/6 , 17 ins. \times 12 ins. at **8**/6 , 17 ins. \times 12 ins. at **8**/6 , 17 ins. at **8**/6 , 17 ins. at **8**/6 , 18 ins. at **8**/6 ins. at

India Rubber Bands for Platinotype Tins. Two sizes 3d. each India Rubber Cloth, various qualities, suitable for Shutter Blinds, and all

other purposes.

Grey Rubber Bands, used for packing and a variety of purposes.

Boxes containing I gross, 1/6 each; smaller sizes, 9d. per gross; large size, 6d. doz.

India Rubber Finger and Thumb Stalls.

Six sizes of each. A good assortment. Special Line. 2d. each. Seamless quality 3d. each Sensitive Finger Stalls. Price 6d.per box, containing three assorted sizes. Rubber Gloves, Sleeves, and Aprons. See page 1186.

Rubber Stamps of all descriptions made in a few hours.

The Altrincham Rubber Co., Mossburn Buildings, Altrincham.

New Superb Backgrounds.

For Sizes and Prices of Scenic Backgrounds, see pages 1164-65.



PHOTOGRAPHIC SUNDRIES.

SPECIAL CORD

for Shutters, 2d. per yard.

SECCOTINE.

The well-known liquid cement, suitable for sticking everything. One dozen 6d. Tubes, 4/6 net

NON-ACTINIC CLOTH

in 3-colours, Ruby, Orange and Canary. Price 1/- per yard.

RENOVATING LIQUID

For Leather Cases, 1/6 per tin or bottle.

WHITE DOUBLE-FACED STRONG RUBBER SHEETING

for lining dishes, tanks, &c., 36in. wide 3/6 per yard.

FOCUSSING SCREENS FOR CAMERAS.

	UUUSSING S	OREENS	run	GAME	MAS.
1	Sizes.	Specially pared ex. Cellulo	thick	Ground Fine Qual	est
	English	each s. 0 0 1 1 2	d. 41 6 9 0 6	each s. 0 0 0 0	d. 2 3 4 6 8
	12 × 10 15 × 12 Continental	4	9	1 2	6
	9 ×12c/m 13 ×18 ,, 18 ×24 ,,		6 0 0	0 0	3 6 0

The Altrincham Rubber Co., Mossburn Buildings, Altrincham.

New Superb Backgrounds.

For Sizes and Prices of Scenic Backgrounds see pages 1164-65.





Dust your plates before using.

PLATE DUSTER.

For removing dust from plates or films before placing in slide or developer.

Beautifully made with Silk Plush Pad in Polished Mahogany Handle, and complete with ribbon to hang up, superseding Camelhair Brushes, being more effective in use, and also cheaper.

 $\frac{1}{4}$ -plate size 1/- ; $\frac{1}{2}$ -plate size, 1/4 ; 1/1-plate size, 1/9 each.

Altrincham Rubber Company,

Tel. Address: RUBBER, ALTRINCHAM.

Telephone Nos. 184 and 185.

THE ALTRINCHAM RUBBER COMPANY'S

New Superb Backgrounds.

For Sizes and Prices of Scenic Backgrounds, see pages 1164-65.





WITH NETAL BALL OR SPIRIT

CAMERA LEVELS.

In Polished Brass. Nickelled or Oxidized Black.

Price 9d. each.

SPECIAL DOUBLE TUBE LEVEL.

2/6 each.

PHOTOGRAPHERS' INDISPENSABLE PLUMB-LINE,

Consisting of an improved shape, highly finished, silverplated "Plumb-Bob," with two yards of strong shutter cord attached, complete in box, price ONE SHILLING

each. Invaluable for Architectural Photography, in order to obtain an accurate vertical position, It is also useful as a time measurer, as when the cord is looped up to about 40 ins, and the "plumb-bob" is allowed to swing, it gives approximately beats of 1 second, thus affording a means of measuring time in recording an exposure.

PLUMB INDICATOR.

As illustration

Attaches to side of Camera Polished Brass. 6d. each.

Silver-plated 7d. each.

Shows when Vertical Architectural lines are true and parallel.



The Altrincham Rubber Co., Mossburn Buildings, Altrincham,

THE ALTRINCHAM RUBBER COMPANY'S

New Superb Backgrounds.

For sizes and prices of Scenic Backgrounds, see pages 1164-65.



Pneumatic Plate Holder.

Very Strong. Everlasting Wear. Extremely Useful.

No Outfit complete without it.

THREE SIZES.

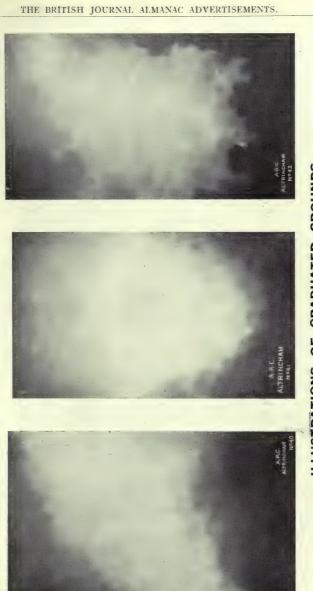
Each one neatly boxed.

THE ALTRINCHAM RUBBER COMPANY,

Tel, Address: Rubber, Altrincham. Telephone Nos. 184 & 185.



THE ALTRINCHAM RUBBER COMPANY'S NEW SUPERB BACKGROUNDS.



ILLUSTRATIONS OF GRADUATED GROUNDS.

PRICES AND SIZES ON PAGE 1165. ANY OTHER DESIGN PAINTED TO ORDER.

The Altrincham Rubber Co., Photographic Specialists and Background Painters, Mossburn Buildings, Altrincham.

THE ALTRINCHAM RUBBER COMPANY'S Developing Aprons and Sleeves.



RUBBER CLOTH DEVELOPING APRON.

Suitable for all Photographers-Ladies and Gentlemen. Price 3/9, Neatly Boxed.

DEVELOPING SLEEVES, 1/6 per pair. Neatly Boxed.
Both SLEEVES and APRON are indispensable to all Photographers, either Amateur or Professional. Easily slipped on and off. Perfect protection, against Chemical splashes.

INDIA-RUBBER DEVELOPING GLOVES.

* Sizes	 				1	2	3 1	4
Prices	 				5/9	6/-	6/3	6/6
-	If lined	Stock	kinette,	1/3	per pair	extra.		

These sizes are equivalent to 61, 7, 71, to 82 ordinary gloves.

The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM.

THE ALTRINCHAM RUBBER COMPANY'S

WASHABLE BACKGROUNDS.

These Backgrounds are made in various sizes (see below) and different colour on each side, except the Graduated, which are plain on one side.

IN FLATTED OIL. PLAIN AND GRADUATED.

Always clean, flat, and free from creases.

Mounted on Rollers top and bottom. Samples on application,

Colours—Buff and Slate Grey; Stone and light Grey; Slate Grey and Cream; Slate Grey and Green; Slate Grey and light Grey or Blue.

PRICES.

	1/3 per yard length.	72 inches wide 2/3 per yard length
60 ,, ,,	1/9 ,, ,.	96 ,, ,, 4/6 ,, , ,,
Sizes. Different colour each side,	one side one side	Different colours or one side each side, graduated in graduated Plain, distemper, in oil,
50×40 2/3	6/ 7/-	72×72 5/ 13/ 13/9
60×40 2/9	7/3 8/3	90×72 7/6 16/ 16/8
70×40 3/-	8/6 9/6	96×96 14/6 24/ 24/9
70×60 4/6	10/3 11/-	108×72 10/ 19/6 20/3

BLACK WOOLLEN BACKGROUND MATERIAL 96 inches wide, Price 8/per yard, full width of material; may be rolled or folded without creasing.

LANTENR SCREENS.

Well shrunk, edges turned in, hemmed and fitted with tapes or brass eyelet holes.

PRICES.

5 f	t. squa	re without	seam,	each £	0 4	0 4	16	ft. so	quare, j	oined wi	th wid	e		
6	11	21	**	17	0 8	6			width i	n centre	each	£2	0	0
8	11	,	12	11	0 10	0	18	11	12	22	22	2	10	0
9	11	11	22	11	0 14	0	20	21	21	11	11	3	3	0
10	22		11	11	0 16	0	24	21	11	11	21	4	0	0
12		joined with	wide	width			26	**	11	17	22	5	15	0
		in centre			1 2	0	28	21	11	11	22	6	6	ō
14					1 10	0	30	22	22	11	77	7	0	Ö
15	11	17		11	1 12	6	3-	17	"	"	71			

OPAQUE LANTERN SHEETS.

Prepared with pure White, Flexible, Opaque Surface, mounted on Roller, with Batten,
Cord and Pulleys.

8×8 feet 30/-; 10×10 feet, 38/-; 14×14 feet, 66/-; 16×16 feet, 84/-, 9×9 ,, 33/-; 12×12 ,, 50/-; 15×15 ,, 72/-; Larger sizes quoted for.

The Altrincham Rubber Company, Offices and Showrooms: Mossburn Buildings, ALTRINCHAM.

Important to Photographers.

THE ALTRINCHAM RUBBER COMPANY'S

ANTI-CLIMATIC

PNEUMATIC

SHUTTER RELEASE

NOW WORLD FAMED

STANDS ANY CLIMATE,

Complete, only 1/3.

NTRODUCED by our Principal, who has for some 20 years been connected with the Wholesale and Manufacturing Photographic Trade, and who is therefore intimately acquainted with the requirements of Photographers.

It is made of a Special Quality Red Rubber, which has for many years been in use for various purposes in some of the most trying climates in the World.







Much dissatisfaction has for a long time existed with regard to the Rubber of which Balls and Tubes have hitherto been made. Coated Rubber, Rubber Mixture, Rubberine, and similar preparations have all proved unsatisfactory, hence it is with considerable satisfaction we announce that, after prolonged and very costly experiments, not only has a satisfactory article resulted, but one that, notwithstanding the many advances in the price of Rubber in late years, is less costly than other similar productions.

UNSOLICITED TESTIMONIALS.

"The Anti-Climatic Rubber of which your goods are made is splendid. All other shutter releases I have used have perished in no time, but yours shows no signs of doing so".—J.H.C.

"We seldom have to make a complaint re your Balls and Tubes" .- H. LTD.

May be obtained from all Dealers or direct from

The ALTRINCHAM RUBBER Co., Photographic Specialists Patentees and Manufacturers.

(A. W. S. SANDERSON, PROPRIETOR),

Telegrams: Rulber, Altrincham." Mossburn Buildings, ALTRINCHAM,

Also at Brussels, Christiania, Stockholm, Paris, St. Petersburg and Madrid. ENGLAND.

Anti-Climatic Shutter Release

PRICE LIST. Each Complete Release (standard pattern), consisting of Round Ball, 2 feet of Tubing s. d. and Teat joined together by means of a special Screw Connection ... The ball may be unscrewed at will, and screwed up again when an air-tight joint is secured. Complete Release, as above, but Variegated Rubber ... " " Enamelled Black " Enamelled Red. Arabesque, variegated Red and Black, not Anti-Climatic quality Oval Release (No. 1 size) consisting of Ball and 2 feet of Tubing for Iris Shutters 1 but Black Enamelled 3 11 11 " Variegated ... Smaller Release consisting of either Round or Oval Ball and Tubing for small Folding Pocket Camera (or extra small size 9d, only)

Black Enamelled (or extra small size 1s. only) Variegated Rubber, two shapes ... Professional Release, consisting of Large Ball, Black Hard Rubber Tap, 3 feet of special Stout Tubing, suitable for studio work Special bellows Studio Studio with wooden plug and r yard white tubing ... Black Double Spray Bellows (for Flash-Light Lamps), complete with net, Small size, 3/6; Medium size, 3/-; Large size SUNDRIES & ACCESSORIES. No. o Ball only, suitable for working 5 feet of Tubing

Bulbs, with vulcanite mouthpiece, ready for slipping tube over, No. o size, 1/6 each. No. 1 size, 1/9 each. No. 2 size 2/3 each. No. 3 size 2/6.

Extra Teats, ordinary plain, 2d. each; Black or Red Enamelled, 3d. each; Arabesque, 4d. each; extra strong, plain Red, 3d. each; Studio, 9d. each; Small Bellows Teat, 6d. each; Elongated two and three-fold bellows (14 different sizes), with tube attached for Guerry and other Studio Shutters, 1/6 to 2/6 each, according to size. Large round two-fold Bellows Teat, 1/4 in. diam., with pieces of Stout Tubing attached, 1/6. ditto 1/3 die 1/6 each.

1/6; ditto, 18in, diam., 1/6; ditto 14in. diam., 1/6; Three-fold ditto, 1/9 each.

Tubing—Ordinary, 3d. per foot; extra stout, as used for Professional Release,
4d. per foot; Arabesque, 5d. per foot: Stout Black Sheet Tubing, 4d. per foot; Best

Red I.R. Tubing, very durable, **6**d. per foot (cloth surface). Black Hard Rubber Taps, **1**/- each; Brass Screw Connections, **3**d. per pair; Brass Taps, **1**/**3** each; Metal Latches for Special Studio Shutter Releases, **1**/**6** each. Sanderson special Brass Tube Clip, 1/- each,

Tube Connection for fastening Tubing to Teat, 1d, each; suitable Wire, 1d, per yard. The compound word ANTI-CLIMATIC is moulded on each Standard Pattern

Shutter Release.

The large Balls with Long Tubes are suitable for releasing the Shutter when the operator is some distance from the Camera, as well as for self-portraiture and with groups, also for Studio use. Any length of Tubing up to 150 feet, without a join can be supplied.

BELLOWS TEATS for STUDIO SHUTTERS.

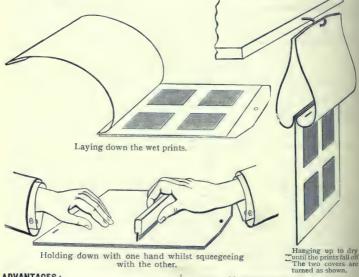
Of every description, Round, Square, Elongated, 2-fold, 3-fold, 4-fold, any size and shape supplied, either from stock or made to order. Large 6-fold Round Bellows for Gas Regulators. Makers of Apparatus requiring Rubber Washers, Bellows, etc., are invited to ask for quotations.

The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM.

THE SANDERSON PATENT.

SOUEECEE TROUBLES

PERFECT POLISH'&'PERFECT MATT' SOUEEGEE PADS.



ADVANTACES:

Abolishes all squeegeeing troubles. Gives a beautiful surface to gelatine prints.

Prints don't stick. No French chalk required.

No blotting paper or troublesome fluff No troublesome cleaning.

No scratches on prints, because the glazing paper is protected from dust and dirt when out of use by sheet rubber covers, book fashion.

No loose parts—self contained. Will last for years—very durable.

THE "PERFECT POLISH"

gives glossy prints and is for use with glossy paper.

THE "PERFECT MATT"

gives a beautiful Matt (or dull eggshell) surface on prints. Suitable for any kind of paper, Matt or Glossy P.O.P., Bromide, or Gaslight,

INVALUABLE FOR DRYING CARBON TISSUE, NO DANCER OF FOG. For Prices and Testimonials, see next page.

May be obtained from all Dealers, or from the Patentees and Manufacturers. The Altrincham Rubber Co., Mossburn Buildings, Altrincham.

THE SANDERSON PATENT SOUEEGEE PADS.

UNSOLICITED TESTIMONIALS.

Opinion of E. B. KNOBEL, Esq., Managing Director of ILFORD LIMITED, "I think your Squeegee Pads most useful and convenient. The two you have sent e excellent Please send . . . to Ilford Limited. I think it is a very me are excellent good thing.

"I have just been lately using one of your Patent Polish Squeegee Pads, Glossy No. 2, and like them too. I have done 1,200 Post Cards on them besides hundreds of 1/1 pl. and 1-pl. Prints. I am pleased to say that I have never found one to stick, and

the same is as good as new, thus beating the pulp slabs."—P.W.S.

"I am using one of your large size Sanderson Squeegee Pads, it has given me perfect satisfaction and I would not think of going back to the Plate Glass process."

"I beg to enclose 1/8 to payfor Squeegee Pad which I like very much. Please send me one of the largest size you make for Glossy Prints and oblige."—W.H.
"I already have your Squeegee Pads, 4 or 5 of them of both sizes and like them

much."—E.B.C.

"I enclose P.O. for another of your 15in, × 12in, Perfect Polish Squeegee Pads. Kindly
"I enclose P.O. for another of your 15in, × 12in, Perfect Polish Squeegee Pads. Kindly send same as soon as possible, also would you kindly send your Catalogue with Price List as he took a fancy to my Pad as soon as he saw it and thought it was very simple. I find you can get 16 on 5/- Pad."—J.A.F.
"Please forward me a 'Perfect Polish Squeegee Pad,' size 12in, × 10in. for Glossy

Prints, 3/9 P.O. enclosed for same.

I am delighted with the sample one I purchased from you some time ago. Not a single print or post-card have I had stuck on the Pad which are as you say 'Perfect."

"Please to send me the price of your Squeegee Pads, for the one as I had from you has been a good one."-A.H.

PRICE LIST.

Size and Price.	Numbers of prints Pad will take.		
No. 1, for Glossy Prints \ No. 10, for Matt Prints \ \} 1/6	Two half-plates $(6\frac{1}{2} \times 4\frac{3}{6})$, or Two 5 x 4, or For quarter plate $(4\frac{1}{4} \times 3\frac{1}{3})$, or Eight smaller size.		
No. 2, for Glossy Prints 2/6	Two 10 x 8, or Two whole plate $(8\frac{1}{2} \times 6\frac{1}{2})$, or Four half-plate $(6\frac{1}{2} \times 4\frac{3}{4})$, or Eight 5 x 4, or Quarter-plate, $4\frac{1}{4} \times 3\frac{1}{4}$.		

"Perfect" Flat Squeegee

For use with the above.

(See page 1172 for description.) No. 100.

For No. 1 Glossy Pad, or No. 10 Matt Pad. } 9d. each.

No. 200.

For No. 2 Glossy Pad, 1/3 ea. or No. 20 Matt Pad,



The Altrincham Rubber Co., Mossburn Buildings, Altrincham.

THE ALTRINCHAM RUBBER COMPANY'S

NOTED

HAND CAMERA CASES

IN GREAT VARIETY.

Stock Size, 91×41×8 in., or any other size made to

STIFF PATTERNS.



No. 2	Similar	Case	exactly,	but	with	lock	and	
	key						each	5
No. 2	Grev Tv	veed 1	ined thro	nohe	mit · bu	est les	ther	

No. 3		, lined	throughout	; best !	eather	
	fittings				each	5/9
N.T.	C' '1 C	7 .	214 4 7			-

1400	4	Dillitia: Casc, but with lock and k	CYO	Cacii	- 10
No	5	Best Strong Dark Waterproof Twe	ad	lined	
140.	3				
		throughout, and made up similar	to 1	No r	
		tinoughout, and made up similar	LO 1	140, 1	



LIMP CASES: same Stock Size.

No. 8		unlined, leather	
		straps each	2/6
		e in this pattern, at 2/3 each.)	

No.	9 W	aterpi	oof (Grey	Tw	eed	do.	do),	each	2/9	ð
No.	IO W	aterpi	roof (Grey	Tw	eed li	ned t	throu	ghou	it ea.	3/3	ä
No. 1	II W	aterp	roof	Best	Stro	ong I	ark	Twee	ed, 1	ined		
	thi	rougho	out b	est gr	reen	baiz	ė.			each	3/8	ð

No.	12 Tan Mail	Canvas,	duck lined	brown	leather	
	fittings					3

SOLID LEATHER CASES, Black, Brown,

and Chocolate; same Stock Size.

No.	13	Stiff Pattern Case, with hand and shoulder	
No.	14	straps, two snap fasteners each Best Solid Leather, lined throughout with	9/6

	velvet;			handle;	
should	er strap ;	lock and	kev	each	13/6
N.BWe wil	l make up	any of	these na	tterns in	other

than our stock sizes without delay. Any Case can be specially made with Velvet Lining for 6d, extra.

WHEN ORDERING a Special Case please always state— 1st.—The Length, that is across the front from left to right.

2nd.—The Width, that is the gusset or front to back. 3rd.—The Depth, or from top to bottom.







ALTRINCHAM RUBBER COMPANY'S NOTED THE Camera Cases.

Any special size in any quality made to order in a few hours. Perfect satisfaction guaranteed,







Best quality Waterproof Tweed. 2nd quality Waterproof Tweed.

2nd quality Solid Leather.

DESCRIPTION.		S12	ZES ANI	D Pric	ES	
Best quality Waterproof Tweed, very superior	1/4	5×4				12×10
dark coloured, with chocolate leather binding;	plate	plate	plate	plate	plate	plate
same colour stout straps all round the case;						
lined green felt, 3 loose pads, good lock and						
key, strong leather handle, and long shoulder				4=10		
straps; buckles all leather covered each	12/6		14/6			24/-
Lined Velvet and Velvet covered Pads extra	1/-	1/-	1/-	1/6	1/6	2/-
Same quality Waterproof Tweed Case, but with collapsible sides and loose division, lock and						
	7/-	8/-	9/-	12/-	14/-	18/6
Cheaper quality Tweed Case, also dark colour,	-/-	0/-	3/	1.2/-	1-0/-	10/0
lined green felt, stiff pattern, suitable for						
popular sets each	6/-	7/-	7/6	10/-	12/6	18/6
popular sets each Same Case, but made in superior style with			-,-	-	,-	,.
handle, web shoulder strap and lock and						
Best quality Tan Mail Canvas Case, with choco-	8/-	9/-	10/-	12/6	16/-	20/-
Best quality Tan Mail Canvas Case, with choco-						
late coloured fittings, good broad web						
shoulder strap, stiff pattern (if with lock and		010	441	40/	40/0	
key, 1/- each extra) each Second quality Tan Mail Canvas, stiff pattern.	8/-	9/6	11/-	13/-	16/6	20/-
black fittings, no lock and key each	7/-	8/6	9/-	11/-	13/6	17/6
Tan Twill Waterproof, stiff pattern. lined		0,0	3/-	••/-	13/0	11/0
throughout green felt, carrying handle and						
web sling strap (a remarkable case for the						
money	4/6	4/9	5/-	7/6	10/6	14/6
Tan Mail Canvas Satchels A good collapsible	1					1 1/0
camera case, remarkably cheap each		4/-	4/6	6/6	_	-
A cheaper quality Tan Case or Dark Tweed each		3/6	3/9	5/6	_	
Best possible quality Brown Solid Leather						
Camera Cases, velvet lined throughout, velvet						
covered pads, lever locks, 2 keys. May be had in black leather if preferred each	OF/	07/0	201	251	AFI	/
			30/-			55 /- 45/-
A cheaper quality each	10/-	10/	. 40	70/-	30/-	1-4-07/-

N.B.—All the above stand camera cases are made to hold Camera, three Slides, Lenses, and Focussing Intermediate and larger sizes made to order at correspondingly low prices.



Best quality Waterproof Tweed, ¼ to 1/1 pl., 6/-; 10×8 and larger, 7/6. Best quality Tan Mail Canvas or second quality T weed, \$\frac{1}{4}\to 1/1\to 1/1\to 5/-\; 10\times 8\tand larger, \$\frac{6}{3}\to 18\tank Leather Case for round metal tripods, \$\frac{5}{6}\to 1000 Tan Mail Case for ditto, \$\frac{4}{2}\to 1000 Web Shoulder Straps and Swivel at each end, 2/-.

WHEN ORDERING a Special Case please always state -1st.—The Length, that is across the front from left to right.
2nd.—The Width, that is the gusset or front to back.
3rd.—The Depth, or from top to bottom.

The Altrincham Rubber Co., Mossburn Buildings, Altrincham.

The SANDERSON TIME AND INSTANTANEOUS

Roller-Blind

The Roller Blind Type of Shutter is by far the most popular, and is now used on almost every Stand Camera. It has become

The Sanderson Shutter is made in two styles, as shown in the engravings, viz .:-

STANDARD PATTERN
To fit on either the Hood or Tube of the Lens;

BEHIND LENS PATTERN
To fit on to Camera Front,

BOTH THE SAME PRICE. It is Perfectly Reliable; gives equal Illumination all over the plate; is easy to work; stands Hard Usage without getting out of order; and there is No Vibration. It is well finished and beautifully French

Polished, and is a good article at the lowest possible price.

It gives Time & Instantaneous Exposures, and is fitted with a Speed Indicator, and Pneumatic Release.

The Time Exposures are of any desired duration—lasting as long as the ball is squeezed. Long Exposures for "Interiors" or very dark places are obtained by pulling the Setting Cord only half way (to the first catch) which sets the Shutter open (also for focussing).

The Instantaneous Exposures are obtained by turning the knob until the Pointer shows the desired speed on the Indicator Dial. The range is from 1/15 to 1/90 second in the smallest size of shutter; 1/80 in the 2 in. size; 1/70 in the 21 in.; and the others in proportion.

The Automatic Timer (described on page 1195, price 3/6 extra) is strongly recommended. It enables the Shutter to give Short "Time" Exposures Automatically, instead of by duration of ball pressure, and is indispensable. The times are 1, 1, 1, 2, and 3 seconds.



Standard Pattern.



Behind Lens Pattern.

PRICES.

Standard (Hood) and Behind Lens Patterns are same price.

When ordering state which is required. Speed Indicator and Pneumatic Ball and Tube are included in price. Automatic Timer (see page 1195), 3/6 extra. Strongly recommended. Adjusting to fit Customer's Lenses- no charge. Send size when ordering. To fit Hood or Tube up to inches diameter— 1\(\frac{1}{2}\) 1\(\frac{1}{3}\) 2 2\(\frac{1}{2}\) 3 3\(\frac{3}{4}\) 4

To it Hood or Tube up to inches diameter— 1 1 2 2 3 3 4 4 4 5 5 tandard Pattern With Indicator $\begin{pmatrix} 14.6 & 15 \\ -16.6 & 16 \\ -17.6 & 20 \\ -24 \\ -24 \\ -26 \\ -26 \\ -27.6 & 30 \\ -24 \\ -28 \\ -32 \\ -36 \\ -32 \\ -36 \\$

ous Shutter made.

'Reliable' Focal Plane



From 20/-

The strong features of this shutter are its Remarkable Simplicity and Cheapness. It is free from all the complications of other Focal Plane Shutters, such as cords, chains, hooks, sliding knobs, or other devices for altering the slit. Neither are there any perplexing calculations to be made before the speed can be ascertained by the user. These advantages are all obtained by making the blind with a Fixed Slit of invariable width. The speeds are 1/200, 1/400, 1/600, 1/800, 1/1,000 of a second. This range of speed covers every possible requirement in Rapid, Instantaneous Work, such as Foot, Horse, Boat, or Motor Races; Birds, Anirals, Men or Machines in Rapid Motion, &c., &c. The Shutter is set by turning a knob. and released by squeezing the pneumatic ball. The speed is shown by a glance at the Indicator Dial. The Shutter fits into the back of the Camera, and works close before the sensitive plate. Focussing of the picture on the ground glass may be effected by using the full size auxiliary focussing aperture at the end of the blind.

Price complete with Speed Indicator.

1-plate 20/-

5×4 22/6 27/6

71×5 32/6 8½×6½ 37/6 Fitting to Camera, from 5/- extra.

New Patent Automatic Timer.



TIME INDICATOR

By the use of this simple device, any Roller Blind Shutter which ordinarily only gives (automatically) instantaneous exposures such as 1/90, 1/75, 1/45 1/30, 1/15, &c., can now be made to give a far more extended range (also automatically). A reference to the illustration shows a moveable pointer, which can be instantly placed to any of the periods of time shown on the dial, including $\frac{1}{10}$, $\frac{1}{10}$, $\frac{1}{10}$, $\frac{1}{10}$, and 3 seconds. Pressure of the ball opens the shutter. The Timer closes it automatically, and thus stops the exposure at the precise moment desired. It can be used with the Sanderson or any other make of Roller Blind Shutter and also other styles. It joins on to the rubber tubbing of the pneumatic release.

Price only 3/6

or if fitted to our Anti-Climatic Shutter Release 4/9

CONTROLS THE EXPOSURES
(Automatically stops at the right moment),

FITS ANY MAKE OF SHUTTER.

Innumerable Testimonials from delighted users. List Free.

The ALTRINCHAM RUBBER Co., Photographic Specialists and Background Painters, MOSSBURN BUILDINGS, ALTRINCHAM.

THE SANDERSON

STUDIO SHUTTERS.



The "SILENTUS" pa

(A Silent Roller Blind Shutter for Studio Work).

Combines all the advantages of the Roller Blind System of Shutter without its disadvantages for Studio Work.

Small and Compact, but with large aperture.

May be used inside or outside the Camera.

Requires no Setting- always ready.

Opens instantly. Closes instantly. Remains open as long as the ball is pressed.

Silent in action. Works without the sitter's knowledge.

The best Shutter for restless children, nervous people, alert animals.

It was be fitted on the front of the lang (hood or tube):

It may be fitted on the front of the lens (hood or tube); or to the camera front (behind the lens); or inside the camera, on the projecting back tube of the lens.

There are no cords, dials, knobs, or other external parts—nothing but a simple ball and tube (see illustration).

FROM

20/-

PRICES.

		To fit o	on Lens Hood	or Tube up to	inches	diameter.
2 in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.
20/-	25/-	27/6	30/-	40/-	45/-	50/-
	Interme	diate or other	sizes at propor	tionate prices.		





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To work inside the Camera. Best English Make-our own.

From **20**/-

Thoroughly reliable.

No vibration.

Absolutely noiseless.

The Bellows are made of Real Leather, not merely stiffened Canvas.

The Rubber parts are of the Highest quality.

The Shutter is quickly and easily attached to the inside of the camera front, and can be readily removed when desired. The Pneumatic Release, by which the Shutter is opened and closed, consists of a strong pear-shaped bulb, metal latch, and 7 feet of stout tubing. The focusing arrangement is exceedingly simple, the pressing of a lever by the side of the bulb keeps the shutter permanently open; the raising of the lever causes it to close.

Sizes and Prices of Shutters including Pneumatic Release: £1 15 0 21 inches £1 0 0 | 41 inches £1 6 0 | 61 inches 6 2 7 1 17 4 0 51 1 10 0 73 2 0 0 31 2 6 5 0 6 1 12 6

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whole Camera may fall with a crash on the floor.

The simple device illustrated prevents such accidents. It is made of Rubber, of best quality, and may be stretched to fit on to

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When not in use it may be left in position, or removed by rolling back the rounded edge until the shoe comes right off.

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Prices quoted include all these features.

o) ognare	Commo	047	,,,,,,	
1-Plate		€2		
1/1,,			10	
10× 8ins.		6	10	0
12 × Ioins.		8	15	0
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41	×	31		£3	0	0	
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61	×	43		7		6	

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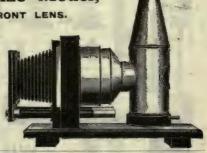
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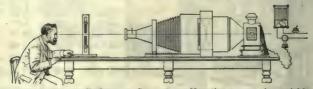
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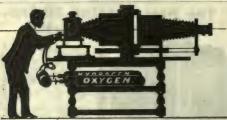
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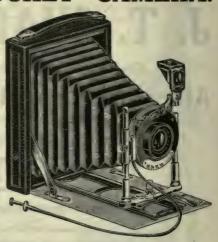
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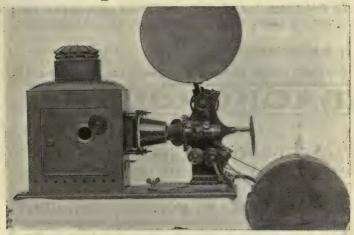
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It isn't necessary for you to send us your negatives, but, if you do, our charge for printing out is 9d. each up to half-plate (61 x 43); above that size, ls.; postage for return of negative, 6d. extra. We cannot be responsible for any damage, though we take every possible care.

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These advantages are secured by the Thames Colour Plate. It does not call for special apparatus. The camera with which you are familiar cau at once be used. You put in a plate, expose and develop it, and the thing is done. The chemicals are few and in everyday use.

The Thames Colour Plate consists of two essentials. (1) The colour screen and (2) the sensitive coating. The colour screen is made by putting down on glass the three primary colours in regular sequence and order so minutely that there are nearly 70,000 atoms of pure colour in one square inch. This colour screen has been described by an eminent scientist as a "marvel of construction." The sensitive coating is very like that of the customary dry plate, except that it is "panchromatic," i.e., sensitive to all the colours.

The Thames Colour Plate is put on the market in two forms, each of which has certain advantages. In one (the "separate" method) the colour screen and separate coating are on two thin separate glasses. In the other (the "combined" method) the colour screen and sensitive coating are on the same glass.

The "separate" method can only be used in dark slides capable of taking the two thin glasses. It has the enormous advantage that duplicates in colour can be made with the greatest ease to any number.

The Thames Plate is the only plate that permits of such duplication in colour from one exposed plate. It is due to the fact that our colour screens are mechanically made, and therefore all alike. This remarkable power of duplication is proving a money-getter to the professional photographer.

The "combined" method can be used in any camera intended for glass plates and flat films. It gives one beautiful result, but duplication, although possible, is not so re_dily obtained.

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For the Lantern.—The remarkable brilliancy of the Thames Colour Plate makes it available for lanterns of small illuminating power. Friends in the Colonies and in foreign countries should have in mind that there will be a ready market in this country for photographs in colour of topical scenes and events made by the "separate" method of the Thames Colour Plate, permitting of duplication. They would be a complete novelty.

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71 61				Postage.					Postage.	
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5½×3½		4/-		4d.	53×33		4/6		3d.	
6½×4¾		5/3		4d.	61×42		6/-		3d.	
7 × 5		7/6		4d.	7 × 5		7/6		3d.	
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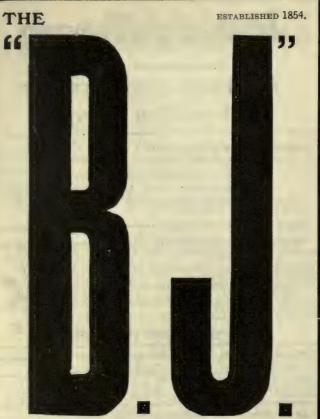
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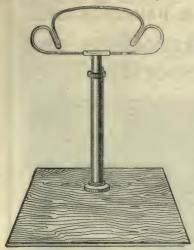
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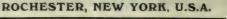
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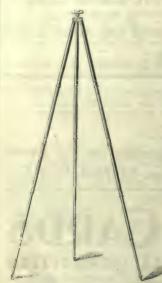
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My experience from practical knowledge is that Cameras made from the finest quality of Indian Teakwood are more suited to resist extreme climatic changes, thus practically bringing to an end the worry, trouble and inconvenience which have existed in the past. The advantage of Teakwood over Mahogany will be apparent, at a glance, to the uninitiated when the relative natures are considered.

TEAKWOOD.

This wood, being full of the natural oil of the tree, which it retains, offers resistance to the two great extremes, moisture and dry heat. Warping and twisting will be, therefore, reduced to a minimum. The appearance of the wood when polished is very like that of Mahogany.

MAHOGANY.

This is a harder and closer grained wood, and before it can be built into a Camera it is necessary to expel the natural sap by years of air-drying. In such a dry condition it is capable of absorbing a large quantity of moisture, which, should this happen, would naturally cause the wood to swell and twist. If after absorption it should be subjected to a dry heat, it will then have a tendency to warp and split, and cause a general disablement of the instrument.

It will, therefore, be seen that Teakwood is the most suitable material for a varying climate, and in addition to causing little or no trouble, the lifetime of the Camera is enormously prolonged.

All "Challenge" Cameras are supplied in Teakwood, if desired, at slightly increased prices, namely, Camera and three slides, $\frac{1}{2}$ -plate, $\frac{10}{5}$: $\frac{5}{4}$, $\frac{15}{5}$: Post-Card size, $\frac{17}{6}$; $\frac{1}{2}$ -plate, $\frac{20}{5}$; $\frac{1}{7}$ -plate, $\frac{30}{5}$.

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Is the Most Perfect Type of the Reflex

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Portrait and Figure Studies, Press Work, Natural History and all Sporting Subjects.

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ADVANTAGES.

The Camera is ready at a moment's notice; it shows the exact view with the same definition and illumination as it will appear on the negative, either horizontally or vertically, and can be focussed right up to the moment of exposure. The shutter release is placed on the opposite side of the instrument from the focussing knob, and this obviates any loss of time when exposing for quick moving objects. The two most serious difficulties are thus overcome, namely, the Estimation of Distance and the Accuracy of Focus.

With such freedom from uncertainty one is enabled to devote attention entirely on the "subject to be photographed," and is able to fully consider the exact

moment best for exposure.

CONSTRUCTION.

The "Challenge" De Luxe Reflex is built for practical use, and the material throughout is of the highest order; the workmanship is of the finest description; and, although constructed in a compact form, rigidity and strength have not been in any way sacrificed.

Focussing is regulated by diagonal rack and pinion, ensuring exceedingly easy and fine adjustment.

The Rising and Falling Front is also actuated by rack and pinion action.

The Reflecting Mirror is silvered on the surface and specially treated to preserve the polish, and shows the image absolutely free from distortion.

The setting of the Mirror is of an ingenious description, and is so arranged that the action carries it backward, before reaching the normal position, thus permitting the use of lenses of very short focus. The same release sets off both mirror and shutter, and the timing is such that the shutter cannot act until the mirror is clear of the light rays transmitted by the lens.

The "Challenge" Focal Plane Shutter is operated either with the finger or the Antinous non-perishable release. It is fitted with a quick wind and set with a half turn of the setting handle, so that there is practically no time wasted in preparing for the exposure. The speeds of the shutter are from r/roth to r/roooth part of a second, in addition to time exposures as long as desired.

All adjustments are made from the outside, the width of slit or opening of blind is recorded on the dial on the left side of camera, and this, combined with the tension of the shutter, as tabulated on the speed plate, shows at a glance the rate at which the shutter is travelling without the necessity of any complicated calculation.

A Revolving Back is fitted to the camera, so that the plate can be changed from the horizontal to the vertical position with the greatest of ease, and in the least possible time. It is not necessary to close the shutter of the slide if you desire to change from one position to another.

Lizars' "Challenge" De Luxe Reflex Camera—contd.

Hood.—The hood is a special feature in this instrument. It stands \$\frac{3}{4}\$ in, high in the \$\frac{1}{4}\$-plate size, and creates a perfect dark chamber, so that the finest and most accurate focussing can be carried out. It is automatic in rising and automatic in closing, and is undoubtedly the most perfect hood existing. The hood is also arranged for access to the ground glass for the purpose of dusting and cleaning. The ground glass is easily removed, so that the mirror can also be dusted.

The Bellows is of real leather, specially cross-grained, varnished, with truncated corners.

The Extensions of the cameras are as follow:—1-plate, 9\frac{1}{2} in.; 5 × 4, 12 in.: \frac{1}{2} -plate, 14 in.

At full extension they have a rigidity which makes them particularly suitable for tele-photography.

The Risk of Vibration when taking a picture is at the minimum, as the exposures are obtained with extreme sensitiveness of pressure, and the release of the mirror is regulated by spring tension—a most important feature.

STEREOSCOPIC MODEL.

A new departure in Reflex construction is the introduction of a combination stereoscopic and panel size model. The camera is manufactured on the same principle as the "Challenge" De Luxe Reflex previously described.

It is made for stereoscopic work, and in addition, by a simple method in removing the divisions of the camera, is also suitable for the ordinary post card size of picture, or panel stereoscopic size. The double dark slides are made to take the ordinary stereoscopic size of plate, 6‡ in. × 3‡ in.,

and also the post-card size of $5\frac{1}{2}$ in. \times $3\frac{1}{2}$ in.

The front of the Stereoscopic Camera is detachable, and an extra panel is supplied for use with

a single lens. The division can be expeditiously removed in an easy manner.

The back division is of a novel idea. It is made in two parts, which are hinged top and bottom, so that they lie perfectly flat when the camera is in use for panel or post-card size pictures.

TROPICAL MODELS.

The difficulty experienced in warm or damp climates with the ordinary forms of Reflex Cameras has induced me to place on the market an instrument specially designed to withstand the most severe climatic variations, and one that will be serviceable and reliable in every working detail.

This model does not depart in any way, so far as the working parts are concerned, from the ordinary De Luxe Reflex Camera, but the manner in which it is put together and the materials

employed in the manufacture are entirely different.

Teakwood, so well known as a damp and heat-resisting product, is exclusively used in the framework of camera and dark slides, and these are carefully brass-bound at all the important parts.

All tongues and mitres, where not bound with brass, are of metal in place of wood as usually employed, and these parts, in addition to being glued, are carefully screwed right through the metal bindings.

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The Bellows is made of real Russian leather, and attached to the camera with brass plates. The blind of the shutter is made of a special material, which will stand extreme heat. It is attached to the rollers by means of brass plates, thus doing away entirely with the use of rubber and other solutions, which are so liable to perish.

The Cameras are supplied polished in place of being leather-covered, the latter being so liable to decay and leave its support when exposed to damp atmosphere.

Care and consideration are features which have predominated extensively in the construction of these instruments.

ADDITIONAL FITTINGS.

Telephoto Attachment.—The "Challenge" De Luxe Reflex Cameras are admirably adapted for use with Telephoto Lenses, by which one obtains an enlarged image, and these are specially useful when photographing subjects inaccessible with the camera and its usual lens. Photographers in Landscape, Architecture, and Natural History will find many opportunities for the use of a Telephoto Attachment.

Full particulars of suitable Telephoto Attachments can be had on application.

The "Challenge" Daylight Loading Adapter.—The usual form of dark slide is sometimes discarded as being too cumbersome, in which case special provision has been made in order that all the leading forms of plate and film appliances may be readily adapted. The "Challenge" Daylight Loading Adapter, combined for plates and films, is the most perfect system devised for the daylight loading of plates and flat films. It is constructed of the best material and is leather covered. The envelopes for carrying the plates or films are of strong black cardboard.

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"Challenge" Adapter, fitted for the Reflex Camera 20 18 6 20 18

Lizars' "Challenge" De Luxe Reflex Camera—contd.

PRICE LIST. ORDINARY MODEL.

Price as per Specification, with Three Best Quality Book-form Double Dark Slides.

Particulars of Lens.	4½ × 3½ (½-Plate).	5×4	$6\frac{1}{2} \times 4\frac{3}{4}$ (\frac{1}{2}\cdot Plate).
Aldis Lens, Series II., F/6		£17 5 0	£21 10 0
	6½ in. lens.	7½ in. lens.	8½ in. lens.
Ross Homocentric Lens, Series C, F/6'3	15 10 0	19 10 0	24 0 0
M-1 0- TT-1 (4 O-1 1) T O YII 72/6	6 in. lens.	7 in. lens.	8½ in. lens.
Taylor & Hobson "Cooke" Lens, Series III., F/6.5	16 0 0 6 ² in, lens,	20 0 0 7½ in. lens.	23 15 0 81 in. lens.
Zeiss "Tessar" Lens, F/6'3		221 0 0	£25 10 0
ZCLSS TCSSAT LICHS, 1703	6 in. lens.	7 in. lens.	81 in. lens.
Ross Homocentric Lens, Series B, F/5.6		21 0 0	25 10 0
	6 in. lens.	7 in, lens.	81 in. lens.
Goerz Double Anastigmat Lens, "Dagor," F/6.8	17 5 0	21 5 0	25 15 0
	6 in. lens.	7 in.lens.	81 in. lens.
Goerz Double Anastigmat Lens, "Celor," F/4'8		21 10 0	26 - 5 0
	6 in. lens.	7 in. lens.	8½ in. lens.
Zeiss "Tessar" Lens, F/4'5		22 0 0	27 0 0
	6 in. lens.	710 in. lens.	84 in. lens.
Lenses by other makers. Price	es on applicat	ion.	
Camera and Three Book-form Double Dark Slides	£12 0 0	£15 0 0	£18 0 0
Extra Book-form Double Dark Slides, each	0 9 0	0 9 6	0 10 0
"Challenge" Changing Box with Leather Bag, for			
Six Plates	0 18 6	1 2 6	1 5 0
Solid Leather Case, with Lock and Key, Hand and			
Shoulder Straps, to hold Camera and Three	1 2 0	1 7 0	4 10 0
Slides	1 2 0	1 7 6	1 12 6

TROPICAL MODEL.

Price, with Three Best Quality Book-form Double Dark Slides.

Particulars of Lens. '	4½ × 3½ (½-Plate).	5 × 4	$6\frac{1}{2} \times 4\frac{3}{4}$ ($\frac{1}{2}$ -Plate).
Aldis Lens, Series II., F/6	£17 15 0	£22 15 0	£28 10 0
	64 in. lens.	71 in. lens.	$8\frac{1}{2}$ in. lens.
Ross Homocentric Lens, Series C, F/6'3		25 0 0	31 0 0
	6 in. lens.	7 in. lens.	8½ in. lens.
Taylor, Taylor & Hobson "Cooke" Lens, Series III.,			
F/6*5	20 0 0	25 10 0	30 15 0
	63 in. lens.	7½ in. lens.	8½ in. lens.
Zeiss "Tessar" Lens, F/6'3	20 15 0	26 10 0	32 10 0
	6 in. lens.	7 in. lens.	8‡ in. lens.
Ross Homocentric Lens, Series B, F/5'6	21 0 0	26 10 0	32 10 0
	6 in. lens.	7 in.lens. *	8½ in. lens.
Goerz Double Anastigmat Lens, "Dagor," F/6.8	21 5 0	26 15 0	32 15 0
	6 in. lens.	7 in. lens.	8¼ in. lens.
Goerz Double Anastigmat Lens, "Celor," F/4.8		27 0 0	33 5 0
	6 in. lens.	7 in. lens.	8½ in. lens.
Zeiss "Tessar" Lens, F/4.5		27 10 0	34 0 0
	6 in. lens.	710 in. lens.	8¼ in. lens.

STEREOSCOPIC MODEL.

Price, as per Specification, with Three Best Quality Book-form Double Dark Sildes, and

with carefully paired Lenses.		S.	
Beck Symmetrical, F/8, 6 in. focus Lenses			
Aldis Lenses, Series II., F/6, 6½ in. focus	20	12	6
Ross Homocentric Lenses, Series C, F/6'3, 6 in. focus			
Taylor, Taylor & Hobson "Cooke "Lenses, Series III., F/6.5, 6% in focus	26	0	0
Zeiss "Tessar" Lenses, F/6 3, 6 in. focus	28	3	0
Ross Homocentric Lenses, Series B, F/5.6, 6 in. focus	28	8	0
Goerz Double Anastigmat Lenses, "Dagor" F/6.8, 6 in. focus	28	18	0
Lenses by other makers. Prices on application.			

LIZARS' "CHALLENGE"

DE LUXE CAMERA.

(PATENT.)



De Luxe Camera open for ordinary work.

A Camera possessing an invaluable range of adjustments hitherto unable to be acquired in an instrument of moderate dimensions.

The fact that it can be used as an ordinary Hand or Stand Camera, embracing at the same time all the requirements for copying, architectural, wide-angle, and tele-photographic work, with sufficient extension to use the single component of most lenses, will convey an appreciable idea of its many accomplishments, which are all attained in a very simple manner.

As a result of much careful thought and experiment, the combination in a single instrument capable of being utilized for all the work described will appeal to the serious worker as well as

the beginner, who in time will recognise the great advantages to be gained with such a camera.

For ordinary hand use, the camera is simply opened and pulled forward to position, the universal movements being brought into action only when actually required.

Amongst the many novel features of the "SWING FRONT" are:—
Enormous Rise, Extreme Side Movement, Great Extension, Extent to which it can be set back for short-focus lenses, Tilting of the lens to any degree upwards or downwards.

Prices, with three Double Dark Slides, with Aluminium Draw-out Shutters

Description of Lens.	41 × 31 1-plate.	5×4.	Post-C			te.
Lizars' "Kram" Convertible Three Foci Lens Aldis, Series II., F/6 Lens Taylor, Taylor & Hobson Lens "Phaos" Anastigmat Lens, F/6:8 to F/7'5 Ross 8ymmetric Anastigmat Lens Ross Homocentric Lens, Series C. F/6:3 Taylor & Hobson "Cooke" Lens, F/6:5 Goerz Double Anastigmat Lens, "Dagor," F/6:8 Dallmeyer Stigmatic Lens, F/6	# s. d. 6 10 0 7 8 0 8 12 6 9 15 0 9 15 0 11 0 0	\$ s. d. 7 10 0 8 17 6 8 19 6 9 15 0 10 10 0 11 5 0 11 5 0	8 0 9 7 9 9 10 5 11 0 11 15 13 10	d. 0 6 6 0 0	£ 8. 10 0 11 16 11 7 12 12 13 15 14 10 14 10 16 5	d. 0 6 0 0 0 0 0 0

If supplied with three Book-form Double Dark Slides in place of above, the additional cost is for \(\frac{1}{2}\)-plate, \(\mathbb{L}1 \) 0s. \(\mathbb{O}d. \); \(5 \times 4 \) and Post-Card, \(\mathbb{L}1 \) 10s. \(\mathbb{O}d. \); \(\frac{1}{2}\)-plate, \(\mathbb{L}1 \) 5s. \(\mathbb{O}d. \)

A modified form of above, the "Minor De Luxe" Camera is supplied complete with Beck Lens, B. & L. Shutter, Brilliant View Finder, Spirit Level, Solid Leather Case, three Double Dark Slides with Aluminium Draw-out Shutters and Focussing Hood.

Prices, 4-plate, £5 10s. 0d.; 5×4, £6 5s. 0d. 4-plate, £7 15s. 0d.

Lizars' 'Challenge' Tropical De Luxe Camera

A MASTERPIECE IN CONSTRUCTION.

PATENT).

Cameras that will resist the ravages of a ropical Climate.

In the manufacture of the "Challenge" dode! De Luxe Cameras in Teakwood, coniderable thought has been given, and every are exercised in order to make these instruments suitable for the most severe climatic variations.

The value of **Teakwood** as a damp and ieat-resisting material is known to all who are resident in a Tropical country. The **Gameras** are **Polished** in place of being **Leather-Govered**, the latter being so liable to decay and leave its support when exposed to a damp atmo-

All Tongues and Mitres where not brass bound are of Metal, instead of wood as usually employed, and these and all other ioints, are not only glued but carefully Screwed.

In addition the Cameras and Book-Form Double Dark Slides are Brass-Bound at all

the important parts.

The Bellows are made of Real Russia
Leather and attached to the bodies of the
Cameras with Brass Plates.

LIZARS

Otherwise these instruments are the same as the specification of the "Challenge" De Luxe Cameras described on the preceding page,

These Cameras are fitted with Revolving Backs. PRICES AS PER SPECIFICATION.

Description of Lens.	42 × 31 1-plate.		Post-Card	
Taylor, Taylor & Hobson Lens "Phaos" Anastigmat Leus, F/6·8 to F/7·5. Ross Symmetric Anastigmat Lens Ross Homocentric Lens, Series C. F/6·3 Taylor & Hobson "Cooke" Lens, F/6·5. Goerz Double Anastigmat Lens, "Dagor," F/6·8.	10 0 0 10 18 0 12 2 6 13 5 0 14 10 0	11 10 0 12 17 6 12 19 6 13 15 0 14 10 0 15 5 0 15 5 0 17 0 0	£ s. d. 12 10 0 13 17 6 13 19 6 14 15 0 15 10 0 16 5 0 18 0 0 17 10 0	

With special cross-grained varnished leather Bellows, in place of real Russia leather, and three Teak Double Plate Holders in lieu of three Brass-bound Book-form Dark Slides

PRICES, AS PER SPECIFICATION.

Description of Lens.	4t × 3t			4	Pos 5				∳ X . -pla	
Lizars' "Kram" Convertible Three Foci Lens Aldis Lens, Series II., F/6 Taylor, Taylor & Hobson Lens "Phaos" Anastigmat Lens, F/6*8 to F/7*5 Ross Symmetric Anastigmat Lens Ross Homocentric Lens, Series C, F/6*3 Taylor & Hobson "Cooke" Lens, F/6*5 Goerz Double Anastigmat Lens, "Dagor", F/6*8 Dallmeyer Stigmatic Lens, F/6	8 13 9 17 11 0 11 0 12 10	6 0 0 0	£ s. 9 0 10 7 10 9 11 5 12 0 12 15 12 15 14 10 14 0	0 0		15 2 4 0 15 10	0 6 6 0 0 0 0	12 13 13 14 15 16	7 12 15 10 10	d. 0 6 0 6 0 0

Lizars' 'Challenge' Dayspool. No. I.

The Most Perfect Daylight Loading Film Camera Manufactured. Can be used with Plates, without any alteration.

Loaded and

Unloaded

in

Daylight.



Films developed Daylight.

This shows the Camera open ready for taking an oblong photograph.



Camera closed. showing its compactness: size of }-plate model only 8 x 4 x x 2



When using plates the back panel is removed and a dark slide substituted.

BRITISH MADE.

makes

ITS SPECIAL FEATURES. BRITISH LABOUR.

BRITISH CAPITAL.

Can be used with plates as well as films without any increase in bulk.

Lenses by every maker can be adapted, provided the focus is not more than 51 inches for 1-plate Pitted with the famous Baus h & Lomb "Automatic" shutter; also shutters of other

Supplied with special automatic Locking Device when front reaches infinity.

Supplied with special automatic Locking Device when front reaches infinity.

Made of the finest Spanish Mahogany throughout, and absolutely free from any thin sheet
metal so liable to get dented, twisted, and out of order.

Undoubtedly a Camera that will slip with freedom into any ordinary coat pocket.

Being easily loaded and unloaded in Daylight, it is an ideal ladies' companion.

Films can be developed in Daylight by using the developing tank.

Anyone possessing a Bausch & Lomb "Unicum" shutter or similar shutter, with a lens not
exceeding 5½ inches in focus, can have it applied to one of the quarter-plate Cameras at a nominal
cost, the lens and shutter being still available for any other Camera.

Wherever it is seen it is appreciated, owing to its charming appearance and simplicity.

Wherever it is seen it is appreciated, owing to its charming appearance and simplicity. For producing work of the highest excellence it cannot be surpassed.

Many other advantages are enumerated in the specification which follows.

Specification of No. 1 Dayspool.

Camera.—Of the Folding Pocket type, made of thoroughly seasoned and finest Spanish Mahogany, either polished or covered in best hard Morocco-grained leather. Handsome leather bellows with a new and improved method-of fixing to the Camera, safeguarding all risks of admission of stray light. Instantly opened and front pulled out on brass guides, and securely and rigidly fixed at any position with quick-acting clamping screw. There is also an infinity catch, which automatically locks the front when at that distance without the necessity of clamping. Ten out of twelve exposures are made on the oblong way of the film or plate, consequently it is more serviceable when it opens in that form. A carefully graduated scale for various distances is fixed to the baseboard. Rising and cross front for horizontal and vertical pictures. No projection beyond the flush of the Camera, therefore nothing to catch on the sides of the pocket. Can be used on a stand.

flush of the Camera, therefore nothing to catch on the sides of the pocket. Can be used on a stand.

Shutter.—The shutter supplied is the famous Bausch & Lomb "Automatic," with time and instantaneous movements, approximately from 1 to the 100th part of a second, and released either by ball and tube or finger trigger, both of which are supplied. Being constructed of metal throughout, extreme climatic changes do not affect it. Other makes of shutters can also be fitted.

Lenses. -All lenses are carefully selected and tested before fixing to the cameras, and each

is fitted with Iris diaphragm.

Finder.—The new brilliant form, giving approximately the same view as that shown by the lens and reversible for horizontal or vertical pictures.

Finish.—Great exactness and most beautiful work throughout.

PRICES AS PER SPECIFICATION

1 111020, 10 1211 01	
Description of Lens.	Size. Size. Size. Size. Size. $4\frac{1}{4} \times 3\frac{1}{4}$ 5 × 4 Post-Card $5\frac{1}{4} \times 3\frac{1}{4}$ 7 × 5
Beck Symmetrical Lens Aldis Lens, Series II., F/6 Taylor, Taylor & Hobson Lens "Phaos" Anastigmat Lens, F/6'8 to F/7'5 Ross' Symmetric Anastigmat Lens Ross' Homocentric Lens, Series C F/6'3 Taylor & Hobson "Cooke" Lens, F/6'5 Goerz Double Anastigmat Lens, "Dagor," F/6'8 Dallmeyer Stigmatic Lens, F/6	£ s. d. d. d.

The Kollos and Compound Shutters can be fitted to these Cameras. Prices on application.

Camera only, and fitting customer's own Shutter and Lens (not exceeding 5 \(\frac{1}{2} \) in. focus for \(\frac{1}{2} \) -plate, 6 in. for 5 \(\times 4 \) and Post-Card size and 8 in. for 7 \(\times 5 \), supplying and fitting view finder, and scaling													
Scaling Screen with Hood, and one Double Dark Slide with safety light traps, and Aluminium Draw-out Shutters O 10 0 0 12 0 0 12 0 1 1 0 0 0 0 0 0 0 0	and Lens (not exceeding 5\frac{1}{2} in. focus for \frac{1}{2}-plate, 6 in. for 5 \times 4 and Post-Card size and 8 in. for		S.	d.	£	S.	d.	£	s:	d.	£	S.	d.
inium Draw-out Shutters 0 10 0 0 12 0 0 12 0 1 1 0 0 0 0 0 0 0	scaling	2	10	0	3	5	0	3	7	16	4	7	6
Ordinary pattern book-form Double Dark Slides in place of the solid patterneach, extra 0 3 6 0 4 0 — 0 4 6 "Challenge" Changing Box with leather bag to carry six plates			10	0	0	12	0	0	12	0	1	-1	0
Ordinary pattern book-form Double Dark Slides in place of the solid patterneach, extra 0 3 6 0 4 0 — 0 4 6 "Challenge" Changing Box with leather bag to carry six plates				0	0	6	6	0	7	6	0	8	0
place of the solid pattern each, extra 0 3 6 0 4 0 - 0 4 6 "Challenge " Changing Box with leather bag to carry six plates													
"Challenge" Changing Box with leather bag to carry six plates			- 2				۸				0		
carry six plates			3	0	U	•			_			•	0
Stand Attachment for taking upright pictures 0 3 6 0 4 0 0 4 6 0 5 0 Solid Leather Case to hold Camera 0 6 6 0 8 6 0 9 6 0 12 0												_	_
	carry six plates				1		6		-		1	5	0
	Stand Attachment for taking upright pictures	0	3	6	0	- 4	0	0	4	6	9	5	0
			6	6	0	8	6	0	9	6	0	12	0
			8	R	0	Ř	R	0	8	6	0	12	ň
		93					-1	_			07 ×	21	4 0 1
			48	XZ	9 ^	2 ~	48	114		3 ^	98 ~	oğ.	X 22
Weight of Camera, including Lens, Shutter and	Weight of Camera, including Lens, Shutter and												
Finder	Finder	26 C	unc	es.	32 0	oun	ces.	38 0	ounc	es.	54 0	ounc	ces.

The "Dayspool" Cameras are supplied with Long-Extensions at the following additional prices:—1-Plate, 15/0; 5×4, 18/6; Post-Card Size, 20/0; 7×5, 25/0.

A Speciality is made in a Teakwood Model of the "DAYSPOOL" CAMERAS.

The additional cost is-

4-Plate, 10/0; 5×4, 15/0; Post-Card Size, 17/6; 7×5, 20,0

Lizars' 'Challenge' Junior Dayspools.

IDEAL POCKET CAMERAS. High-Class Construction. Exceedingly Compact. For Daylight Loading Films.



The Junior Dayspool Cameras have been designed to meet the demand for a high-class and really compact instrument suited for the most serious workers.

They are in every respect identical with the specification of the No. 1 Dayspool, with the exception of the shutter, which is a Bausch and Lomb, with time and instantaneous movements, approximately from 1/25th to 1/100th part of a second. The Shutter is automatic, or ever-set, on the same principle as the famous automatic "Unicum."

The Lenses are Rapid Rectilinear of superior quality, and have Iris Diaphragms.

The Cameras can be loaded and unloaded in daylight, and are supplied with the new brilliant view-finders.

MADE IN THREE SIZES. DDIATE

	PRICES :		
	Junior "A." for pictures 21 × 21.	Junior "B." for pictures 21 × 31.	Junior "C." for pictures $2\frac{1}{2} \times 4\frac{1}{4}$.
With "Challenge" R.R. Lens. Solid Leather Case to hold Camera Dimensions of Camera	£ s. d. 2 7 6 0 5 6	£ s. d. 2 12 6 0 5 6 7\(^8\times\) 3\(^8\times\) 1\(^8\times\) 1\(^8\times\) 1\(^8\times\) 16 ounces.	# s. d. 2 15 0 0 6 0 8 * x 3 * x 1 * 17 ounces.

The Junior "B" Model is also made suitable for use with plates. Focussing Screen and one Slide, 9/-; Extra Double Dark Slides, 4/- each.

THE "CHALLENGE! DAINTY POCKET CAMERA.

For plates 31×21.



Size of Camera

 $4\frac{7}{8} \times 3\frac{7}{8} \times 1\frac{1}{3}$ inches.

Camera.—Is made of finest Spanish Mahogany throughout; beautifully polished, accurately finished, and fitted with superior quality Bellows.

Lens.—Fine quality Rapid Rectilinear Lens, working at F/8, and giving fine definition.

Shutter.—Is a Bausch & Lomb Automatic; works time and instantaneous up to approximately

1/100th part of a second; can be used either with finger or bulb release.

Finder.—Latest improvement in the new Brilliant form, giving exactly the same view as

that shown by the lens, and reversible for either way of the picture.

that shown by the lens, and reversible for either way of the picture.

Bilde.—Single metal slide with embossed centre for numbers.

Special Features.—Camera, Lens Shutter, and Finder all fold up together, and cen be carried in any ordinary jacket pocket. Compactness is one of the principal features aimed at, combined with a high-class lens giving a crisp, clean negative; admirably adapted for those who have occasion to stroll into the country at odd times, or for street scenes, as it can be so conveniently and inconspicuously carried about. Rising front; automatic infinity stop; scaled for various chistances.

PRICE—Complete with one slide Extra Slides....

Lizars' 'Challenge' Model B Stereoscopic Film and Plate Cameras.



Two distinct Models:

- (1) For Plates only, 63 × 31.
- (2) For Daylight Loading Films or for Plates 61 × 31.

These Cameras have been constructed in two forms-namely, with fixed division in bellows, and with loose division. With the fixed division, pictures, either Stereoscopic or Lantern Slide size (31 in.

square), two on one plate, may be pro-capping the one lens and making the exposure with the other. The instrument with the loose division will produce either Stereoscopic Pictures, or, by the removal of the division, the Artistic Landscape or Panel Shape, 6\(\frac{3}{4} \times 3\(\frac{1}{4}\). For the Landscape size it is necessary to have an extra front panel and a 1-plate lens, which take the place of the stereo shutter and lenses.

SPECIFICATION.

Camera.—Made in finest Spanish mahogany, either polished or covered in best quality hard-

grained leather. Focussing hood and leather bellows.

Shutter.—The famous Bausch & Lomb, single valve, variable speed shutter. The two

shutters are everset, and are operated simultaneously by one pneumatic or trigger release.

Slides.—Three in number, double, and of the solid form, with aluminium draw-out shutters, but on a new and improved principle. The light traps which are fitted to the slides are an entirely new device, making them equal to the best book-form pattern. The Slides are only supplied with the Plate Model at the listed prices. Lenses. - All are carefully selected and tested, with Iris diaphragms, controlled by one lever.

Finder.—The new brilliant series, and set as near as possible to show the same view as that

given by the lenses.

Finish.—This is carried out with great exactness, and the pictures are focussed from 6 feet

to infinity on a carefully graduated scale.

Special Points.—Camera, Lenses, Shutter, Finder and Focussing Hood all close up together. Rising front and Swing Back. Focussed by diagonal rack and pinion. Admirably adapted as a Stand Camera, for which purpose bushes are provided. Instantly opened, and immediately set at infinity by the new and improved pull-out front, with quick clamping action. Compactness, lightness, and portability are carried out to a fine degree. Workmanship and finish throughout of the highest grade. PRICES AS PER SPECIFICATION

PAIOES, AS PER SPECIFIC	ATTON.	
Description of Lenses.	Fixed Division in Bellows.	Loose Division in Bellows.
Fitted with accurately paired Rapid Rectilinear Lenses F/8 Aldis Lenses, Series II., F/6 Taylor, Taylor & Hobson Lenses, Ross' Homocentric Lenses, Series C. F/6·3 Taylor & Hobson "Cooke" Lenses, F/6·5. Goerz Double Anastigmat Lenses, "Dagor," F/6·8 Dallmeyer Stigmatic Lenses, F/6	£ s. d. 5 10 0 9 10 0 11 16 0 14 4 0 14 4 0 16 14 0 17 14 0	S. d. 5 15 0 9 15 0 12 1 0 14 9 0 14 9 0 16 19 0 17 19 0
Extra Front Panels for Camera, with loose division in Bello Stand Attachment for taking upright pictures		0 5 0
and Aluminium Draw-out Shutters Extra Double Dark Slides	ea	ach 0 17 6
Book-Form Double Dark Slides "Challenge" Changing Box to carry 6 Plates, with leather Solid Leather Case, with hand and shoulder straps, to hold	bag	1 7 6
Solid Leather Case, with lock, hand and shoulder straps, line Camera and three Slides. Stiffened Mailcoth Canvas Case, lined baize, with hand and	d baize, to hold Pla	ate 0 12 0
Limp Mailcloth Canvas Case, lined baize, with hand and sh		

LIZARS' "CHALLENGE"

Model 1B Stereoscopic Camera.



This Stereoscopic Camera, of the very best workmanship, is for plates $6\frac{3}{4} \times 3\frac{1}{4}$, with loose division in bellows and similar in design to the Model B Stereoscopic Plate Camera described previously. It differs only so far as the shutter, front and slides are concerned, and with these alterations and extra movements it may appeal to some stereoscopic workers as more suitable for this particular class of photography. The Shutter is the "Challenge" Focal Plane or the Goerz-Anschutz Model A Focal Plane, working from 1/25th to

1/1000th of a second, or the Thornton-Pickard Behind Lens with adjustable

centres, and is built into, and forms part of the camera.

The Focal Plane Shutters are fitted with quick wind and Speed Indicator. The front (as shown in illustration) is constructed to give various separations to the lenses, and is fitted with a carefully graduated scale. The panel is detachable, so that another with $\frac{1}{2}$ -plate lens may be used for single pictures.

The three slides supplied are of the best quality Book-form, tongued in well, mitres cross-keyed on surface, rabbeted Frames and Shutters, and with automatic closing springs and automatic stop springs to shutters.

PRICES, as per Specification, Polished or Leather-Covered.

Description of Lenses.		With "Challenge" Focal Plane Shutter.	With Goerz Focal Plane Shutter.
Fitted with accurately paired Beck Symmetrical Lenses, F/8. Aldis Lenses, Series II., F/6 Taylor, Taylor & Hobson Lenses Ross Homocentric Lenses, Series C., F/6·3 Taylor & Hobson "Cooke" Lenses, F/6·5 Goetz Double Anastigmat Lenses, "Dagor," F/6·8. Dallmeyer Stigmatic Lenses, F/6	8 10 0 10 12 0 12 18 0 15 6 0 17 16 0 18 16 0	£ s. d. 9 10 0 11 12 0 13 18 0 16 6 0 18 16 0 19 16 0	£ s. d. 10 10 0 12 12 0 14 18 0 17 6 0 19 16 0 20 16 0

NOTE.—Any make of Lenses supplied. Prices on application.

Camera and Shutter only	£	9.	d. 0	£	S.	d. 0	1 2	s. 10	d.
Camera, Shutter and three Book-form Double Dark							1		
Slides, including fitting of customer's own lenses, supplying and fitting View Finder and Scaling.	7	15	0	8	10	0	9	10	0
Extra Book-form Double Dark Slides each		12			12			12	
"Challenge" Changing Box to carry six plates, with Leather Bag	1	7	6	1	7	6	1	7	6
Solid Leather Case, with hand and shoulder straps,		i.						Ċ	
lock and key, to hold Camera and three Slides		15			15			15	
Front Panels for use with a single lenseach	0	3	6	0	3	6	0	3	6
Brass-binding Camera and three Slides	1	17	6	1	17	6	1	17	8
Dimensions of Camera when closed	81 ×	C 51	× 3 3	81 >	< 51	× 31	81 ×	(5)	× 33

0 18



3 Slides

LIZARS' 'CHALLENGE'

Stereoscopic or Half-Plate Camera.

THE "CHALLENGE" STEREOSCOPIC OF HALF-PLATE CAMERA
has been designed to fulfil certain
essential requirements, i.e., an
instrument capable of doing the
highest quality of work, combining
every necessary movement, portable
and serviceable, capable of doing
either Stereoscopic Photographs or
others of half-plate size, the latter
being produced by removing in a
very simple way the division in the
bellows.

SPECIFICATION.

Camera.—Made in finest Spanish Mahogany, either polished or covered in Morocco leather leather Bellows and Focussing Hood, as shown in illustration.

Shutter.—This forms the front of the Camera and is the Thornton-Pickard best quality. It works either time or instantaneous, and has a Speed Indicator attached. The Shutter has adjustable centres, and an extra panel is supplied with the outfit to use with a single Lens when making half-plate exposures.

Slides.—Three double book-form, tongued in well, mitres cross-keyed on surface, and with rabbeted Frames and Shutters. Will take two sizes of plates, $6\frac{1}{2} \times 4\frac{3}{4}$ and $6\frac{3}{4} \times 3\frac{1}{4}$.

Lonses.—All the Lenses supplied with these instruments are carefully tested and selected, and are fitted with Iris diaphragms,

Finder.—This is of the new Brilliant Series, and is set to give approximately the same picture as that shown by the Lenses.

Special Feature—Camera, Lenses, and Focussing Hood all fold up together and combine in the smallest possible space. Rising Front and Swing Back. Adapted for Horizontal and Vertical Pictures. Scale for various distances. The usual focussing arrangement is provided and actuated by diagonal rack and pinion.

PRICES, as per Specification,

ritions, as	hes	operitoria.			
Fitted with accurately paired £ s. d		Ross Homocentric Lenses, Series			
Beck Symmetrical Lenses, F/8 10 0 (C, F/6'5	16	16	0
Aldis Lenses, Series II., No. 2, F/6 12 2	0	Goerz Double Anastigmat Lenses,			
Taylor, Taylor & Hobson Lenses 14 8 (0	Series III., F/6.8	19	6	0
Taylor & Hobson "Cooke"		Dallmeyer Stigmatic Lenses, F/6	20	6	. 0
Lenses, F/6.5 16 16 0	0				
For Camera and Shutter only			7	0	0
For Camera, Shutter, and three Book-form	Do	puble Dark Slides, including fitting of			
customer's own Lenses, supplying and fi			9	0	0
		each	0	10	6
Solid leather Carrying Case with lock, hand					

Lizars' 'Challenge' Reversing Back, Stereoscopic or Half-plate Camera.

This is identical in every respect with the description given above, with the additions of Reversing Back and extra Extension.

Reversing Dack and Catta Latensio	744.					
PI	RICES,	as per	r Specification.			
Fitted with accurately paired Beck Symmetrical Lenses.	11 0	0	Ross Homocentric Lenses, Series C, F/6'5			
Aldis Lenses, Series II., No. 2, F/6 Taylor, Taylor & Hobson Lenses Taylor & Hobson "Cooke"	15 8	0	Series III., F/6·8 Dallmeyer Stigmatic Lenses, F/6			
Lenses, F/6.5				8	0	0

For Camera and Shutter only
For Camera, Shutter, and three Book-form Double Dark Slides, including fitting of
customer's own Lenses, supplying and fitting View Finder and Scaling
Extra Double Book Slides, each
Solid leather Carrying Case, with lock, hand and shoulder straps, to hold Camera and

LIZARS' "CHALLENGE"

Triple=Extension Outfit.



The Outfit comprises-

Half-plate Camera with Automatic Locking Front, having an independent rise of 3½ inches, Beck Symmetrical Lens, Roller-Blind Time and Instantaneous Shutter or Bausch and Lomb Unicum Shutter, 3-fold Ash Stand and BOOK-FORM DOUBLE DARK SLIDE.

SPECIFICATION.

Camera.—Made of the finest Spanish Mahogany with all practical movements, including triple extension of 24 inches. The extensions are actuated by rack and pinion and also the back moves forward on brass guides for the use of wide-angle lenses. The camera is also provided with square panel front (detachable), swing back, reversing back,

extensive rising front of 34 inches and swing front, and with substantial turntable in base. When camera is opened out the front is automatically locked, but is easily freed when desired to tilt it.

Slide.—Double Book-Form, with rabbeted frames, also triple jointed hinges, rabbeted shutters, which is a great preventative from light being admitted in the event of the hinge-cloth getting worn.

Lens.—Is Beck Symmetrical, of fine quality, working at F/8 and fitted with iris diaphragm. For all-round work a better lens could not be desired.

Shutter.—Is the well-known "Unicum" or Thornton-Pickard, which works either time or instantaneous, with speed indicator of the latest form, and pneumatic release. The shutter forms part of the front of the Camera, but can be detached when desired.

Stand.—Is 3-fold, with sliding bottom, thoroughly well made, compact and perfectly rigid.

PRICE AS SPECIFICATION, IN 1-PLATE SIZE ONLY .. 75/0 NETT.

Extra Double Book-Form Slideseach £0 8 0
Tropical Model (Teakwood, and with important parts brass-bound), otherwise as above...... 4 15 0

Extra Double Book-Form Slideseach 0 12

LIZARS' "IZAR," PRISM BINOCULAR.

Unrivalled for Military, Marine, Hunting and General Sporting Use. **Important Features** Light Weight, High Power, Large Field of View. **Excellent Definition.**



The "Izar" Prism Binocular has been placed on the market with a view to supplying, at a

moderate cost, a Prismatic Binocular of high quality.

The metal work is of a specially hard alloy of aluminium, which has the rigidity of brass, and is only half the weight. The body is substantially and durably made, and is fitted with bending bars for adjusting the pupillary distance. The focussing is actuated from a central screw, and has a separate adjustment for correcting any difference between the two eyes.

These glasses possess great depth of focus and an unusually bright field of view, thus making them specially suitable for radius making according suitable for radius making them.

them specially suitable for racing, yachting and general sporting purposes.

They are supplied in two powers, magnifying respectively 6 and 8 times, and are sent out in

solid leather cases, with shoulder strap.

Price. To magnify 6 times .. £4 15 0 nett. To magnify 8 times .. £5 0 0 nett.



LIZARS' "FULVUE"

PRISM BINOCULAR.

The "Fulvue" Glass is constructed of an extremely hard aluminium alloy, the body and bars are cast in one piece in place of being attached by screws, thus ensuring absolute strength and rigidity.

ansonice strength and rightly.

Focusing is effected by the central milled wheel, but an independent movement is provided enabling one eye to be separately adjusted if required. The width is variable, it may be set in conjunction with the divided scale indicating the separation and then clamped.

To overcome the want of illumination, particularly, in high-power glasses, objectives of 13 inch are used thus admitting three times as much light as in the usual models. When glasses of high power have to be used under unfavourable atmospheric conditions, or at sunset, the "Fulvue" will give greater satisfaction than any other prismatic Binocular.

For racing and yachting purposes the six-times glass has been specially designed and is unequalled. A point of great importance in the construction of these glasses is the ease by which they may be cleaned, this being of im-mense value when in Tropical countries, when optical assistance is not to be had.

Magnification.	Weight.	Field of View at 1000 yards.	Price in best Solid Leather Case.
6 times. 9 times.	19 ozs. 21 ozs. 21 ozs.	80 yards. 60 yards.	\$8 0 0 8 10 0 9 10 0

Complete Field Glass and Telescope Catalogue free on application

LIZARS' "CHALLENGE" CELTIC HAND CAMERA.

A new design in portable Cameras. Quarter-plate size only.



A hand camera with many important advantages, including great compactness and simplicity, and in striking contrast to many of the imported instruments at present on the market

The front of the camera is of an entirely new design, and pulls out on brass guide rails to infinity, where it is stopped automatically (no binding being necessary).

For closer distances the front is extended by means of rack and pinion, and without in any way interfering with the infinity catch. There is also adouble extension of rol inches, thus permitting the use of single components of most lenses. The front has extensive rising and cross movements.

The view finder of the new brilliant form is fitted, and bushes are also provided for use on a stand.

The camera is supplied with the "Challenge" daylight loading adapter of special pattern, which can be used with either plates or films. With this fitment the camera is at all times complete in itself, there being no delay as in the changing of dark slides. The focussing screen also forms part of the adapter, and is provided with a very efficient hood. In this way loose parts are entirely obviated.

The instrument has a very smart appearance, being constructed in black ebonized mahogany, with highly lacquered brass internal fittings, and nickel external fittings.

It is made in quarter-plate size only, and is supplied complete with six envelopes for adapter and Beck Symmetrical lens, in Bausch & Lomb new Automatic shutter.

Price £4 0 0.

Also supplied fitted with other lenses; prices on application.

J. Lizars,

Manufacturer

Photographic, Optical and Scientific Anstruments.



101 and 107, Buchanan Street. 17, Melville Lane. 251, High Holborn, W.C. 13, 15 and 19, Shandwick Place. 8, Wellington Place. 171, Union Street. 71, Bold Street. LONDON EDINBURGH BELFAST .. ABERDEEN ..

Factory, Golden Acre Works, Graignestock Street, Glasgow.

Telegraphic Addresses :-

LIZARS GLASGOW. CAMERATED OPTICAL .. LONDON. EDINBURGH. BELFAST.

OPTICIAN, ABERDEEN. OPTICIAN, LIVERPOOL

Dallmeyer Patent Portrait Lenses.

C. F. LAN-DAVIS' PATENT, 1909.

THE extraordinary speed of Dallmeyer Patent Portrait Lenses, their keepness of definition, good covering power, careful workmanship, accurate testing, high reputation for nearly fifty years, and all-round excellence need no description or printed testimonial.

The latest type of mount which is protected by patent is shown in the accompanying illustration. There are no troublesome bolts to



manipulate, whilst the external appearance has been greatly improved. The lens can be used either to produce exquisitely sharp results or those softer studies in which there is evenness of definition without unpleasant out-of-focus effects.

This unique adjustment is manipulated simply by rotating a portion of the lens. It is wonderfully easy to use and of the greatest value for large portraits. Quite a new power is placed in the hands of the photographer, which enables him to adjust the definition exactly as he desires. The effect is totally different from that given by a lens out of focus.

The most rapid Patent Portrait Lenses are the A and B series, both of which allow of instantaneous shutter exposures in the studio. There is little difference between these two types, the B being a little faster and the A covering a little better. Both are designed for single standing figures, large heads, and small groups in the studio. The D series, which are not expensive, are for large and small groups.

The 3B, 2A, and 3A are recommended for cabinet work, the lenses of greater focal length being preferable where conditions permit. The distance between sitter and lens for a standing figure for cabinet size

J. H. DALLMEYER, LTD., DENZIL ROAD, NEASDEN, LONDON, N.W.

with the 3B or 3D is 18 ft., or 5½ metres, with the 2A 20 ft., or 6 metres, and the 3A 24 ft., or 7 metres. The 1A and 2D require only 14 ft., or 4 metres. For carte de visite the 1B requires 12 ft., or 31 metres, the 2B 18 ft., or 51 metres, the 3B 25 ft., or 71 metres. Any lens can be obtained on trial if a remittance for its value be sent as a deposit.

Some remarkable examples of the speed of the 2B are contained in our new book, "London by Night," price 2d., post free 3d., which is illustrated by snapshots of street scenes in London late at night, taken with the ordinary street illumination only. The 2B and 1A, mounted in aluminium, working at f/3 and f/4, are very suitable for Reflex

Cameras. The additional cost for aluminium is £1 10s.

Dallmeyer Patent Portrait Lenses.

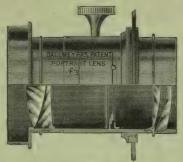
	SERIES B F/3			PRI	CES.	
		Wat	erho	use.	Iris.	
1B	Patent, Focal Length 6 in. (150 mm.).	£	S.	d.	£ s.	đ.
	For CARTE DE VISITE PORTRAITS	7	0	0	7 15	0
2B	Patent, Focal Length 82 in. (210 mm.).					
	For CARTE DE VISITE PORTRAITS	12	15	0	14 0	0
3B	Patent, Focal Length 11 in. (275 mm.).					
	For CABINET PORTRAITS	19	0	0 .	20 10	0
4B	Patent, Focal Length 17 in. (430 mm.).					
	For pictures $8\frac{1}{2} \times 6\frac{1}{2}$ in	38	0	0	40 10	0

Dallmeyer Patent Portrait Lenses.

	SERIES A F/4			PRIC	CES.	
		Wat	erho	use.	Iris.	
	Patent, Focal Length 10 in. (250 mm.).	£	g.	d.	£ s.	d.
	For pictures 5×4 in. and even Cabinet					
	size	12	10	0	13 15	0
2A	Patent, Focal Length 133 in. (340 mm.).					
	For CABINET PORTRAITS	17	0	0	18 10	0
34	Patent, Focal Length 16 in. (405 mm.).					
0.1	For CABINETS and PROMENADES					
	and pictures up to $8\frac{1}{2} \times 6\frac{1}{2}$ in	26	0	0	27 10	0
4A	Patent, Focal Length 18 in. (450 mm.).					
	For pictures 10 × 8 in. and under	36	10	0	38 10	0

J. H. DALLMEYER, LTD., Showrooms: NEWMAN ST., London, W.

SERIES A F/4—continued.	PRICES.	
5A Patent, Focal Length 22 in. (560 mm.). For pictures 15 × 12 in. and under	Waterhouse. Iris. £ s. d. £ s. d. 47 10 0 49 10 0	
6A Patent, Focal Length 30 in. (760 mm.).		
For pictures 20×16 in. and under	57 0 0 59 10 0	



THE ORIGINAL MOUNT.

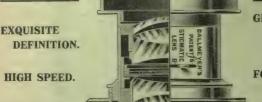
Dallmeyer Patent Portrait Lenses.

SERIES D F/	6.		PRI	CES.	
2D Patent, Focal Length 9 in. (230 mm.). For plates $6\frac{1}{2} \times 4\frac{3}{4}$ in., or with smaller	Wat	erho s.	use. d.	£ s.	d.
stops, 8 × 5 in	6	15	0	7 5	0
3D Patent, Focal Length $12\frac{1}{2}$ in. (320 mm.). And For plates $8\frac{1}{2} \times 6\frac{1}{2}$ in., or with smaller					
stops 10×8 in	9	0	0	9 15	0
4D Patent, Focal Length 17 in. (430 mm.). For plates 10 × 8 in., or with smaller					
stops 12 × 10 in	13	0	0	14 5	0
5D Patent, Focal Length 19 in. (480 mm.). For plates 12 × 10, or with smaller	10	10	C		
stops 15 × 12 in	10	12	6	18 2	р
6D Patent, Focal Length 24 in. (610 mm.). For plates 15×12 in., or with smaller					
stops 18 × 16 in	25	5	0	26 15	0
7D Patent, Focal Length 30½ in. (775 mm. For plates 18 × 16 in., or with smaller					
stops 22 × 20 in	45	15	0	47 15	0
8D Patent, Focal Length 37 in. (940 mm.). For plates 22 × 20 in., or with smaller					
stops 25 × 21 in	55	10	0	58 0	0

J. H. DALLMEYER, LTD., DENZIL ROAD, NEASDEN, LONDON, NW.

DALLMEYER STIGMATICS

Series II., f/6.



GREAT
COVERING
POWER.

FOUR LENSES IN ONE.

Complete Lens for all-round use.

For Amateur Photographers the smaller sizes of the Series II. and the new Series IV. Dallmeyer Stigmatics are most suitable. The prices shown are for the lenses either in ordinary brass mounts or for sunk mounts for Reflex and other Cameras. The lenses are also mounted in focussing mounts and in all between-lens shutters including the Compound, Ibso, Koilos, and Automat, and can be fitted to practically every Camera made.

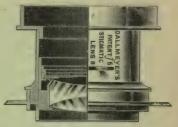
With the Series II. negatives are sharp from edge to edge, and even with the shortest exposures are crisp and brilliant. This series is very suitable for colour photography and wide-angle architectural and other work, covering, when stopped down, a plate two sizes larger. The front combination alone gives a picture twice the ordinary size, and the back a picture half as large again as the complete lens. Used with a telephoto attachment the Stigmatic gives sharp pictures three or four or seven or more times as large as usual.

FOUR LENSES IN ONE.



Front Lens alone.

Pictures twice the usual size.



Back Lens alone.

Pictures half as large again
as with the complete.

The larger sizes are for all professional photography. A football team, a group of aldermen, or a school treat do not like waiting about to be photographed.

With the Dallmeyer Stigmatic the picture is sharp straight away, and requires only a short exposure. Much to the surprise of the sitters the ordeal is over in a few minutes. The results, too, are better than with other Lenses.

They are good also for all-round work in the studio, for copying and for enlarging.

No.	Plate covered at full aperture f/6.	Largest plate covered at f/16.	Focal Length. Inches. Mm.	PRICE, with Iris diaphragms, Plain or Sunk Mounts.	PRICE, in Koilos Shutter
1AA 1A 1 2 3 4 5 6 7 8 9	2½ × 2 3½ × 2⅓ 3½ × 3½ 4½ × 3½ 5 × 4 6½ × 4¾ 8× 5 8½ × 6½ 10 × 8 12 × 10 15 × 12	4½ × 3½ 5 × 4 6½ × 4¾ 8½ × 6½ 10 × 8 12 × 10 15 × 12 15 × 15 18 × 16 22 × 20	3·25 82 4 101 4·5 114 5·3 134 6·4 163 7·6 192 9 228 10·7 271 12·7 321 15·1 382 18 456	£4 0 0 4 5 0 4 15 0 5 15 0 6 15 0 8 2 6 10 10 0 13 10 0 18 10 0 24 10 0 31 10 0	£5 15 0 6 0 0 6 10 0 7 15 0 9 3 0 10 10 6 13 10 0 16 10 0

Pairing for Stereoscopic Work, 8/- extra.

Four Lenses in one. Ask for Free Descriptive Booklet, B1.

J. H. DALLMEYER, LTD.. Showrooms: 25, NEWMAN ST., London. W.

THE DALLMEYER STIGMATIC

Series IV., f/6.3.



A Low-Priced Rapid Anastigmat for Hand Cameras.
Three Lenses in One. Front
combination with medium
extension for pictures three
times the ordinary size.
Back combination for pictures
half as large again as with
the complete.

Careful calculation has led to the production of a new series of Dallmeyer Stigmatics which unite good definition and high speed with simple construction. The unsymmetrical design has been retained, as this has the very great advantage of providing two single lenses of different focal lengths. A Series IV. Stigmatic is thus not only a satisfactory rapid anastigmat giving good definition at full aperture over a large plate. Besides this it is a triple convertible lens, the back combination of which requires very little additional camera extension and gives a picture half as large again as that of the complete lens. It is thus available on fairly short extension cameras. Moreover, the front combination is available for use alone at about double the camera extension. It gives then a picture nearly three times as large as the complete lens. The Iris aperture must, of course, be somewhat reduced for the single lenses.

The highest mechanical and optical excellence are embodied in

this new series, though the prices are very low.

Simplification in design, not a lowering of the quality which for 50 years has made Dallmeyer lenses famous, has made such a result possible. At the same time it must not be thought that this new lens supersedes the Series II. That retains pre-eminence of correction and is on account of its greater powers to be preferred in cases where price is not the decisive consideration.

No.	Plate Sizes. Inches.	Focal Le	ngths.	Prices in either Rigid or Sunk Mounts.
1A.	$ \begin{array}{r} 3\frac{1}{2} \times 2\frac{1}{2} \\ 4\frac{1}{4} \times 3\frac{1}{4} \\ 5 \times 4 \\ 6\frac{1}{2} \times 4\frac{3}{4} \\ 7 \times 5 \end{array} $	344	100	£2 15 0
1.		44	120	£3 0 0
2.		6	150	£3 10 0
3.		7	175	£4 5 0
4.		81	205	£5 15 0

Pairing for Stereoscopic work, 6/- extra

DALLMEYER RAPID RECTILINEAR LENS F/8.

This is the original R.R. having been patented by J. H. Dallmeyer in 1866. It remains an excellent lens for many purposes. The larger sizes in particular are recommended for open air groups.

No.	Size of View or Landscape.	Diameter of Lens.	Equivalent Focus.	PRICE, with Iris Diaphragms,
1 1A 2 3 4 5 6 7 8 9 10 11 12	Inches: 4\frac{4\frac{1}{2}\times 3\frac{1}{2}}{4\frac{1}{2}\times 3\frac{1}{2}}\$ 5\frac{5}{5}\times 4\frac{1}{6}\frac{1}	Inches. Inc	Inches. 4 5½ 6 8½ 10 11 13 16 17 19½ 24 30 33	£ s. d. 3 10 0 3 15 0 4 5 0 5 5 0 6 0 0 8 12 6 8 10 0 10 10 0 11 10 0 14 5 0 19 0 0 25 15 0 31 10 0



DALLMEYER WIDE-ANGLE RECTILINEAR LENS F/16.

This lens embraces an angle of nearly 100 deg. when used with the smallest stop and is free from distortion and flare. The large amount of light transmitted at open aperture makes arrangement of subject easy.

No.	Largest Dimension of Plate.	Diameter	Back	Equivalent	PRICE.					
		of front. Combination.	Focus.	Focus.	Rotating Stop.	Iris Diaphragm.				
1s 1AA 1A 1B 1 2 3 4 5	Inches. 5 × 4 7 × 5 8½ × 6½ 10 × 8 12 × 10 15 × 12 18 × 16 22 × 20 24 × 21	1100 es.	Inches. 24 31 48 56 77 11 14	1 nones. 3 4 51 61 7 81 13 151 19	£ s. d. 3 15 0 4 5 0 5 5 0 6 5 0 7 5 0 10 0 0 13 5 0 19 0 0 28 10 0	£ 8. d. 4 2 6 4 12 6 5 12 6 6 15 0 7 15 0 10 10 0 14 0 0 20 0 0 23 15 0				

J. H. DALLMEYER, Ltd., NEASDEN, LONDON, N.W.

DALLMEYER

Telephoto Attachments.

IN 1891 Mr. T. R. Dallmeyer rediscovered telephotography, and patented later these improved attachments which are for use with Dallmeyer Stigmatics and other good lenses. Each gives a range of three, four, seven or higher magnifications with good definition. The attachments are removable, in no way interfere with the use of the ordinary lens, and are not unduly cumbersome. In general, a negative of half the focal length of the ordinary lens should be chosen. If for use with a Dallmeyer lens, this need not be sent for fitting, but only full particulars as to the mounting furnished.

PRICE WITH RACK AND PINION MOVEMENT.

Focus of Negative Diameter	a ir	n.	1¼ in. 6 in.	2 i:	n. in	$\frac{2\frac{1}{2} \text{ in }}{1 \text{ in }}$	1.	3 in. 1½ in.	4 ii	n. n.	5 i:	n.	6 in. 2 in.	7 21	in.	8 j	n. in.	10 2동	in.	12:	in in.
Brass	£ 3	s. 10	£ s.	£ 3	s. 10	£ :	S. 5	£ s	£ 4	s. 10	£ 5	S. 5	£ s	5 7	s. 0	£	s. 10	£	s. 0	£	s. 0
Aluminium	4	5	4 5	4	5	4 1	0	4 10	5	5	6	10	7 !	8	10	10	0	12	10	15	10

Fitting, except for very large lenses, is not charged for.

TELEPHOTO SNAPSHOTS

with good definition on quarter plates.

The 1A Patent of 10" focal length and 4" Negative-

Gives at 6" extension 25" focal length and aperture f/10

and intermediate and longer focal lengths.

The 1A can be used alone, works at f/4, and gives sharp and soft pictures as desired.

Price, complete in black Aluminium Rack and pinion mount with Iris, £20 10s.

Particulars of more elaborate telephoto lenses on application.

J. H. DALLMEYER, LTD., 25, NEWMAN ST., London, W.

ADON TELEPHOTO LENS.

LARGE PICTURES
ON
SMALL CAMERAS.

ADON.

PASSING SALENT

CONTROL

A PASSO

CONTROL

IMPROVED : :

: : MOUNTING.

HALF SIZE.

The Adon is a complete Telephoto Lens for use alone. It is provided with a flange which is attached to the Camera front, or an adapter can be made to carry the Adon in a larger flange or shutter. There is no need to send the lens or camera for fitting. The Adon is mounted in aluminium, weighs only $4\frac{3}{4}$ ounces, has an iris diaphragm and rack and pinion motion to alter the separation of the glasses and vary the size of the picture and plate covered. It is suitable for cameras from $3\frac{1}{2}\times2\frac{1}{2}$ up to 15×12 , giving large pictures with short extensions.

For mountain scenery, architecture, bird and animal studies, portraiture and the reproduction of jewellery, insect life, and small subjects generally it is invaluable.

A new sliding mount and a slightly higher power negative giving better definition are the improvements this year.

PRICE, including flange and solid leather case, £3 10s. 0d.

Foreign Postage, 1/-

BURCHETT COLOUR SCREEN, 12/6

SMALL SLIDING HOOD to increase brilliancy, 2/6

The JUNIOR ADON for Film Cameras

Permits the taking of Telephoto and Ordinary Snapshots alternately.

No loss of film.

Short exposures.

Larger Pictures.

Spiral focussing by scale.

PRICE, with solid leather case, £2 10s. 0d.

The Adon and Junior Adon are fully described in the Illustrated Booklet, B2
Post Free.

J. H. DALLMEYER, LTD., DENZIL ROAD, NEASDEN, LONDON, N.W.

Dallmeyer Telephoto Calculator.



FULL SIZE.

Is for use with every telephoto attachment and such a lens as the Adon.

Gives instantly any desired magnification and indicates the corresponding intensity.

Dispenses with all troublesome calculations and slips into the smallest pocket, weighing only one ounce.

Is very simple to use and mathematically accurate.

Is also a convenient spring measure for general purposes.

Costs 2/9. POSTAGE 1d.

When ordering, give the focal length of the negative lens, and the distance from the back surface of the negative to the flange.

Descriptive Circular, B3, Free.

The Dallmeyer Bergheim, for Artistic Portraiture.

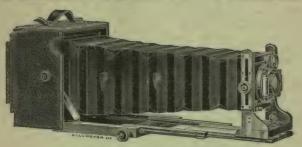
Wonderfully soft results in true perspective. Variable-sized pictures without moving the Camera. Designed by an artist for the use of artists.

	Waterhouse Diaphragm.			Iris Diaphragm.			
No. 1 Cabinet and Boudoir, Rigid Mount No. 1 ditto, Rack Adjustment No. 2, 84 × 64 to 15×12 Cabinet and				£6 7	5 15	0	
Boudoir Rack Adjustment No. 3, 10×8 to Life-size Cabinet and	8	10	0	10	0	0	
Boudoir Rack Adjustment	10	10	0	12	0	0	

J. H. DALLMEYER, Ltd., 25, NEWMAN STREET, London, W.

. . THE . .

CORRESPONDENTS' CAMERA.



TRIPLE EXTENSION.

Designed for great stability at long extension. Made of best Spanish Mahogany, with specially solid front, and finished either leather covered, polished in natural colour, or ebonised.

The front, which has rising, falling, and swing motion, may be clamped at any point. When the swing is not required, a small caten keeps the front parallel with the back.

The lens is fitted to a detachable panel, held in place by swing clips. Pins on each side prevent these clips from accidentally falling open and allowing the panel to drop out.

Reversing and swing back and hooded focussing screen, which saves carrying a cloth. This hood is detachable to allow a magnifier to be used.

Both double and triple extension models are made, which are excellent for telephoto work. The slides have pull-out vulcanite sheaths and are of block form. A film pack adapter, roll holder, or focal plane shutter can be fitted to order.

Either the Series II. f/6 or Series IV. f/6·3 Dallmeyer Stigmatic should be fitted, the long extension amply sufficing for the single components.

Double Extension.

Size $4\frac{1}{4} \times 3\frac{1}{4}$ 5 × 4 Post Card $(5\frac{1}{2} \times 3\frac{1}{2})$ $6\frac{1}{2} \times 4\frac{3}{4}$ Extension, $11\frac{1}{2}$ in. 14 in. 16 in. \$\mathbb{25}\$ 15 6 \$\mathbb{26}\$ 10 0 \$\mathbb{27}\$ 0 0 \$\mathbb{27}\$ 15 0

Triple Extension.

Extension, 15½ in. 17½ in. 23 in. \$6 6 0 \$7 7 0 \$8 8 0 Continental sizes to order.

J. H. DALLMEYER, Ltd., DENZIL ROAD, NEASDEN, LONDON, N.W.

LEDON REFLEX CAMERA



Fitted with a Dallmeyer Stigmatic f/6 in sunk mount. Sufficient extension for the single combinations of the Series II. Rackwork rising and falling front and hinged lens shade (nct illustrated). Focal Plane Shutter, with speeds up to stond second and time. Rotating Reversing Back and rackwork focussing. After the slide is drawn the back may be reversed. Very smooth mirror action, pneumatically damped. Magnifying eyepieces in hood, for easy focussing. Ground glass is hinged for cleaning.

Price complete, including six double slides, Series II. F/6 Dallmeyer Stigmatic focussing eye-pieces, and solid leather case.

Size-1-plate. Extension-101 ins. Post Card. 10 ins.

5 x 4. 13 ins. d-plate. 16 ins. £39.

£22.

£24 10s. £29 10s.

(No Reversing Back).

Camera and 3 slides only—

Size-1-plate.

Post Card.

3-plate.

£12.

£12 10s.

 5×4 £18.

£24 10s.

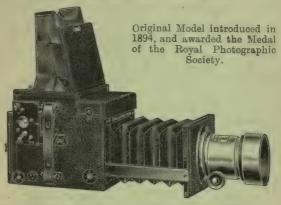
(No Reversing Back).

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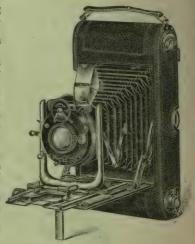
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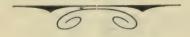
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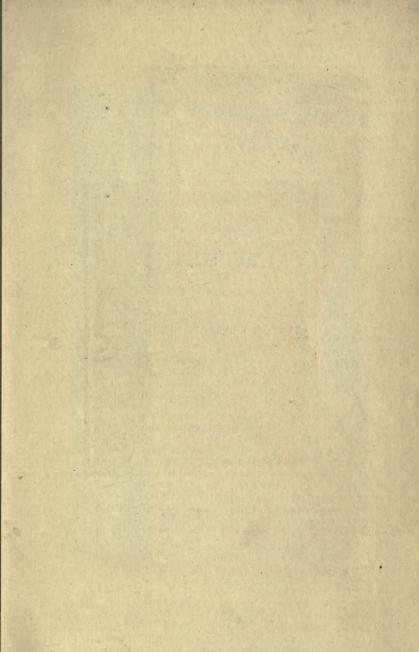
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